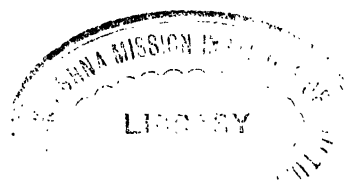


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THE
Surgical Instruments of the Hindus



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THE
**SURGICAL INSTRUMENTS
OF THE HINDUS**

WITH

**A Comparative Study of the Surgical Instruments of
the Greek, Roman, Arab and the Modern
European Surgeons.**

BY

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TO
THE HON'BLE
SIR ASUTOSH MUKHOPADHYAY, Kt.,
Saraswati, Sastra-vachaspati,
C.S.I., M.A., D.L., D.Sc., F.R.A.S., F.R.S.E., F.A.S.B.,
Judge of the High Court of Judicature at Fort William
in Bengal,
VICE-CHANCELLOR, CALCUTTA UNIVERSITY,
Ex-President of the Asiatic Society of Bengal,

AND

Chairman of the Board of Sanskrit Studies,

In recognition of his love of Science, his pre-eminent services to the cause
of University Education, his administrative ability, and his generous
liberality to scholars

AS WELL AS

In grateful remembrance of many acts of kindness,

THIS VOLUME IS

DEDICATED

BY

THE AUTHOR

PREFACE.

For researches into the state of medicine among the Ancient Hindus, we have several sources of information to scrutinise. The remarks of Dr. Payne regarding the sources of information of Anglo-Saxon Medicine may apply here with still greater force.¹

First is the evidence of contemporary literature about the craft of physicians and surgeons, since we are sure that there has always been a class of medicine men of one kind or another. Thus we find in the R̥gveda, the use of artificial limb as a substitute for a limb accidentally lost². From the Mahābhārata,

¹ Payne's English Medicine in the Anglo-Saxon Times, P. 7.

² चरित्रं हि वेरिवाच्छेदि पर्णम्
आजा खेल्स्य परितक्नयायाम् ।
सद्यो जङ्घामायसौ विशपलायै
धने हिते सत्तवे प्रत्यधत्तम् ॥

R̥gveda—15th Bk., 1st Mandala, 116 Sūkta.

अगस्त्य पुरोहितः खेली नाम राजा तस्य सम्बन्धिनी विशपलानामस्त्री, संयामे शत्रुभिः क्षिन्नपदा आसीत् । पुरोहितेन अगस्त्येन स्तुतौ अश्विनौ रात्रौ आगत्य आधीमयं पादं समधत्ताम् । तदेतदाह 'आजा'—आजौ, संयामे, अगस्त्य पुरोहितस्य—खेल्स्य राजतः सम्बन्धिन्याः विशपलाख्याया, 'चरित्रं'—चरणं, 'वेरिव'—वेः पक्षिणः, 'पर्ण' पतत्रम् इव, 'अच्छेदि हि'—पूरा क्षिन्नमभूत् खलु । हे अश्विनौ ! युवां अगस्त्येन स्तुतौ सन्तौ, 'परितक्नयायाम्'—रात्रौ, आगत्य, 'सद्यः'—तदानीमेव, 'सत्तवे'—सत्तूँ गन्तुम् इत्यर्थः, विशपलायै 'आयसौ';—लौहमयीम्, 'जङ्घा'—जङ्घीपलक्षितं पादम्, 'प्रत्यधत्तम्'—सन्धानम् एकीकरणमित्यर्थः कृतवन्तौ ।

we learn that when Parīkṣit, the king of the Kurus, became certain of his approaching death by snake-bite, due to a curse uttered by a sage, he tried to protect himself by the constant attendance of a number of physicians, who were well supplied with antidotes.¹ Again it is stated that when the great warrior Bhīṣma was wounded in war, the skillful army surgeons came to him with the necessary medical and surgical appliances to treat his wounds.² From the Mohāvāgga, we learn that Jivaka, the personal physician of Buddha, practised cranial surgery with success.³ In the Mālavikāgnimitra, we find the use of charms—a signet

- ¹ समन्त्रा मन्त्रिभिर्यैव स तथा मन्त्रतत्त्ववित् ।
 प्रासादं कारयामास एकस्तम्भं सुरक्षितं ।
 रक्षाञ्च विदधे तत्र भिषजयूषधानि च ।
 ब्राह्मणान्मन्त्रसिद्धांश्च सर्व्वती वैम्ययीजयत् ।

Mahābhārata, Adi Parva, Ch. 42.

- ² उपतिष्ठन्नथी वैद्याः शल्योद्धरणकीविदाः ।
 सर्व्वोपकरणैर्युक्ताः कुशलैः साधु शिक्षिताः ।
 तान् दृष्ट्वा जाह्नवीपुत्रः प्रोवाच तनयं तव ।
 धनं दत्त्वा विसृज्यन्तां पूजयित्वा चिकित्सकाः ।
 एवं गते मयेदानीं वैद्यैः काव्यमिहास्ति किं ।
 चतुर्धर्म्यं प्रश्नानां हि प्राप्नोऽस्मि परमां गतिं ।
 नैष धर्म्यो महौपालाः शरतत्पगतस्य मे ।
 एभिरेव शरैश्चाहं दग्धव्योऽस्मि नराधिपः ।
 तच्छ्रुत्वा वचनं तस्य पुत्री दुर्व्योधनसव ।
 वैद्यान् विसर्ज्जयामास पूजयित्वा यथाऽर्हतः ।

Mahābhārata, Bhīṣma Parva, Ch. 121,

Vs. 5745—5750. (A.S.B. Ed.)

³ Mohāvāgga, VIII. 1.18.

ring as a healing talisman for the cure of snake-bite;¹ and also we find there a reference to a class of physicians who specialised themselves in Toxicology (Viṣa-Vaidya),² and were held in high esteem for their professional skill by the public.³ From the Bhojaprabandha, the administration of some kind of anæsthetic by inhalation before surgical operations can be ascertained. Similarly from the books of Law, we know the relations of the profession to society in general. In the Manusmṛhitā, we have unmistakable testimony of the decline of Hindu surgery as the author prohibits the eating of cooked rice from the hands of a surgeon.⁴

¹ सङ्घि ! देवीए इदं सिपिसआसादी आनीदसागमुद्दासणाहं अङ्गुलीअअं सिणिङ्गं
णिभालअन्ती तूह उवाअन्ने पडिदन्नि ॥

Mālavikāgnimitra, Ch. I.

जय ।—जेदु जेदु भङ्गा । धुवसिङ्गी विस्वेदी । उदकुम्भविधाणेण सप्यमुद्दिआ कपिदव्वा ।
ता अशेसीअदुत्ति । धारि ।—एदं सप्यमुद्दअम् अङ्गुलीअअम् । पच्छा मह हट्ठे णम् ।

Ibid, Ch. IV.

² परि ।—छेदी दंशस्य दाहो वा क्षतस्यारक्तमीक्षणम् । एतानि ददमावाणा-
मायुष्याः प्रतिपत्तयः ॥ (संप्रति विषवैद्यानाम् कर्मम् ।)

राजा ।—जयसेने ! धुवसिङ्गिः क्षिप्रमाह्वयताम् ॥

Ibid, Ch. IV.

³ निपु ।—पसणमुहवणो दीसदि । अवि अ धुवसिङ्गिणा विइस्सिदी । मा से
असङ्गणिज्जं पावं ॥

Ibid, Ch. IV.

⁴ चिकित्सकान्देवलकान्मांसविक्रयिणस्तथा ।

विपण्येन च जीवन्ती वर्ज्याः स्युर्हव्यकव्ययीः ॥

Manusmṛhitā, Ch. III, 152.

चिकित्सकस्य मृगयोः क्रूरस्थोच्छिष्टभोजिनः ।

उग्रान्नं सूतिकान्नं च पर्याचान्तमनिर्दशम् ॥

Ibid, Ch. IV, 212.

Secondly, monuments or inscriptions scattered about the country have to be searched, as references found therein to the science of medicine, are more trustworthy than documents which may have been more or less tampered with by interpolations of subsequent writers. Thus we learn from the Edicts of Aśoka, that hospitals were established by him in different parts of his kingdom, not only for the treatment of suffering humanity but also for the brute creation¹.

Thirdly, personages and scenes in connection with medical practice, and figures of herbs may have been represented in works of art which must be thoroughly examined. But unfortunately we do not possess any such work of art and so we can learn nothing to our purpose from this source. In the interpretation of the subject of the Friezes of the Rani Naur and Ganesha's Cave, Dr. R. L. Mitra says,—“The shampooing in the Ganesa Cave may be for a parent, but the close seat with the right hand round the neck of the male personage in the other, would be highly unbecoming in an unmarried female.” But if the stooping figure be taken to be that of a wounded man, a wounded priest for instance, the lady may be a maiden nursing him without any offence to propriety. It is true that the appearance of the figure on the mattress does not indicate suffering from a wound, but in the Rani Naur frieze, the stooping head affords some indication of it.”²

पूयं चिकित्सकस्यान्नं पुंश्चल्यास्त्वन्नमिन्द्रियम् ।

विष्टा वार्धूषिकस्यान्नं शस्त्रविक्रयिणी मलम् ॥

Manusāhhitā, Ch. IV, 220.

¹ Rock Inscriptions, Edict II.

² The Antiquities of Orissa, Vol. II, p. 11.

Fourthly, the various kinds of surgical instruments preserved in museums are to be examined and the reports of finds of surgical appliances in various localities are to be studied. We know what a flood of light has been thrown on ancient Greek surgery by the steady progress of archæological discovery and finds of instruments at Pompeii, Herculaneum and elsewhere, and by the study of the specimens preserved in the Naples museum, the Athens museum and other museums of Europe. But as far as I have been able to trace, our museums contain no finds supplying us with any information on the subject.

Fifthly, the literature of medicine itself should be thoroughly inquired into and excerpts elucidative of our subject should be compared with one another. "The detailed descriptions of the very numerous Hindu instruments not being very minute or precise, Professor Wilson says, we can only conjecture what they may have been, from a consideration of the purport of their names, and the objects to which they were applied, in connection with the imperfect description given."¹ We are fortunate, however, in possessing a copious medical literature of great merit from very early times. We shall describe the important books in the introductory chapter, with short notices of their authors.

Sixthly, the comparative study of the science at the same period in other countries also furnishes us with valuable materials as regards the state of medicine in a country. It is well known that Sanskrit works are often written in a very terse language

¹ Royle's *Antiquity of Hindu Medicine*, foot-note, p. 59-60.

and it might be said with greater truth about the works of early Sanskrit authors, the comment of a learned critic about the style of Thucydides, the famous historian,—“the most obvious and characteristic of his peculiarities is an endeavour to express as much matter as possible in as few words as possible, to combine many thoughts into one, and always to leave the reader to supply something of his own. Hence his conciseness often becomes obscure.” I could not form any idea as to the shape of some of the surgical instruments from the descriptions given in the text books, and the commentators are often silent on those passages. But when I read the accounts of similar instruments in Greek and Roman literature, my difficulties at once cleared up. We know with what brilliant results comparative mythology and comparative philology have been studied of late years, and I am sure that a comparative study of medical science by scholars will lead to interesting discoveries. So I have added descriptions of the instruments according to the Greeks, Romans and Arabs at the end of the descriptions given in Sanskrit books : the former serving as commentaries on the latter.

Seventhly, in the accounts of historians, travellers and pilgrims from foreign countries, may be found notices of medical science, as they saw it practised during their sojourn in a country, and such impressions, if properly collated, may bear impartial testimony to the progress of the science at the time. Again, we must enquire if the original treatises of medicine can be proved to have been translated into different languages and whether the remedial agents of a country can be traced in the Pharmacopœias of different nations. Thus we

learn from the accounts of Houen Tsang and Fa Hian that charitable institutions such as hospitals, dispensaries and Pânyasālās (Houses of Charity) were quite common in ancient India.¹ Arrian informs us in his *Indica* that the study of medicine among the Brahmans was in great favour.² We know that the standard works on medicine were translated in Arabic in the 8th Century B. C.,³ and that various medicinal herbs of Indian origin found their way into the Greek *Materia Medica*.⁴

Eighthly, we must enquire whether the medical practice of ancient times is still resorted to by the physicians of the present days. The Hindu system of medicine is still being practised all over India, more or less in its original form, and so can still be studied at first hand. But for our present purpose, we derive little or no help from the *Vaids* of the present generation. They know practically nothing about anatomy and surgery which began to decline during the Buddhist era, and finally all vestiges of the science became lost during the Mahomedan rule. I have spared no pains to exhaust these sources of information so far as surgical instruments are concerned. Whether or not I have been fortunate enough to give just the necessary details of instruments from the best accessible authorities without at the same time loading my pages with superfluous matter, must be left to the judgment of my readers to determine.

¹ Beal's *Buddhist Records of the Western World*, Vol. I., P. 165, 198 and 214; Vol. II., p. 188 and 303.

² Arrian's *Indica* c. 27.

³ Alberuni's *India*, Sachau's Preface, p. XXX—XXXI.

⁴ Royle's *Antiquity of Hindu Medicine*, p. 77-113.

Now it may be asked why the Science and Art of Surgery, which was successfully practised in Ancient India, is so much neglected by the present generation of *Vaids*. So let us consider the causes that led to the downfall of Hindu Surgery:

1. The Hindus from a very early period have given up the dissection of human bodies—the only trustworthy method of acquiring anatomical knowledge—merely because it may occasion ceremonial uncleanness. The Ancient Hindus were, however, free from such prejudices. Manu lays down that mere bathing will purify a Brahman who has touched a corpse,¹ whilst stroking a cow or looking at the Sun, having only sprinkled his mouth with water will remove the defilement due to touching a dead bone.² But even in the *Manusamhitā*, we can trace the decline of Hindu surgery, and his law forbidding any one from eating food from the hands of a doctor evidently refers to a surgeon.³

2. The interference of the priests in India, as in Europe played an important part. They began to cure diseases by spells, charms, texts and drugs; and temples have served as consulting rooms for the treatment as much of the diseases.

¹ दिवाकीर्त्तिमुदकां च पतितं सूतिकां तथा ।

शवं तस्मृष्टिनं चैव स्मृष्टा स्नानेन शुध्यति ॥

The Institutes of Manu, Ch. V, 85.

² नारं स्मृष्टास्थिं सस्नेहं स्नात्वा विप्रो विगृह्यति ।

आचम्यैव तु निस्नेहं गामालभ्याकमीक्ष्यवा ॥

Ibid, Ch. V, 87.

³ Ibid, Ch. III, 152; Ch. IV, vs. 212 and 220.

of the body as of the soul. The example of such a temple we still find in Tārakeśvar where many sick people repair to have their maladies cured by dreams, hypnotic suggestions and incubation or temple-sleep. Similar practice was prevalent in Egypt and Greece in olden times. The modern practice of using galvanic rings and abdominal belts is merely an advanced method of indulging in superstitious ideas.

3. The patients always dreaded the surgeon's knife—especially when the use of a general anæsthetic was unknown. At the same time, the comparative success of poultices, actual and potential cauterics, and other external applications have influenced the lay mind that operations by knife are not always needed.¹ The Hindu surgeons themselves believed in similar tenets, for Suśruta, the surgeon, remarks that “of all cutting instruments and their substitutes, caustics (or vegetable alkalies) are the most important, because by means of them, deep and superficial incisions and scarifications may be made, and derangements of the three humours (air, bile and phlegm) may be rectified”; and again he says that “with

¹ दिव्यौषधिं विना देवि शस्त्रविद्या मुनिष्फला ।
 वैरुध्यं कुरुते या च दुश्चिकित्स्ये व्यधान्तरे ॥
 आयन्ते हि यथार्शोसि पाटितानि पुनः पुनः ।
 किं तत्र शस्त्रसाध्यं स्यात् सुसिद्धैर्भेषजैर्विना ॥
 धातुना व्यापदि यच्च भेषजं नैव सिद्ध्यति ।
 ह्याभये दुस्तरे तस्मिन् शस्त्रमेव विधीयते ॥
 पुनः संशमनं तत्र धातुनाम् हि प्रशान्तये ।
 प्रदातव्यं महादेवि शस्त्रादब्ध्वाक् ब्रवीमि ते ॥

regard to surgical treatment, actual cautery is said to be superior to caustics, in as much as diseases treated with the actual cautery do not reappear, and because it can cure diseases which are incurable by medicines, instruments and caustics.”¹ Thus we see that the Hindus were partial to external applications as a cure of surgical diseases, and gradually they neglected the surgical operations—one of the most important means of acquiring knowledge in Morbid Anatomy and of testing the correctness of diagnosis, in the absence of the post mortem examinations of the cadavers. Thus not only surgery but medicine also suffered materially.

4. The Hindus always cherish a high regard for the writings of their sages, and the earliest works on medicine became the standard works and were held sacred. Any violation of their opinions was considered a sacrilege ; and all knowledge thus soon became stereotyped. In later times, none dared to question the validity of the statements contained therein, and though about three thousand years have elapsed, and though the votaries of the science are still honoured and wellpaid, the science instead of improving has markedly deteriorated. In fact, only two authors—Caraka and Suśruta—are original; the later authorities—and there is a vast number of them—were merely their servile copyists who only differed from them when they indulged in some grave errors. We have a parallel in the history of medical science in Europe, where Galen

¹ चारादग्निर्गरीयान् क्रियासु व्याख्यातस्तद्गुणानां रीगानामपुनर्भावाद्द्विषजस्रश्चारैर-
साध्यानां तत्साध्यत्वाच्च ।

held his sway over the profession for about two thousand years.

5. One of the potent causes of progressive decadence in the knowledge and practice of surgery amongst the Hindus is the rapid spread of Buddhism in India. Though Buddha sanctioned the use of the lancet in some cases, in cases of a doubtful nature he prohibited the use of instruments in the treatment of even surgical diseases. For example, he allowed the surgical treatment of boils by knife,¹ but he prohibited not only the use of the lancet for treatment of fistula-in-ano but the use of clysters also.² As it would be interesting to know the reasons of this prohibition, I quote the story in full from the *Mohāvāgga* (Sacred Books of the East) :³

1. Now when the Blessed One had remained at Sāvattthi as long as he thought fit, he went forth on his journey to Râgagaha ; and wandering straight on he arrived at Râgagaha; and there at Râgagaha he stayed at the Veluvana in the Kalandaka-nivâpa.

Now at that time a certain Bhikkhu was suffering from fistula. And the physician (named) Âkâsa-gotta lanced it. And the Blessed One when he was going round through the sleeping-places came to the place where that Bhikkhu dwelt.

2. Âkâsa-gotta, the physician, saw the Blessed One coming from afar ; and when he saw him he said to the Blessed One : ‘ Let the venerable Gotama come and look at this Bhikkhu’s orifice ;

¹ *Mohāvāgga*, VI. 14. 4 & 5.

² *Ibid*, VI. 22. 3.

³ *Ibid*, VI. 22.

it is like the mouth of an iguana!’ And the Blessed One thinking, ‘This foolish fellow is making fun of me,’ kept silence and turned away. And in that connection, and on account of that, he called a meeting of the Bhikkhu-saṃgha, and asked the Bhikkhus: ‘Is there, O Bhikkhus, in that Vihāra a Bhikkhu who is sick?’

‘There is, Lord.’

‘What is the matter, O Bhikkhus, with that Bhikkhu?’

‘That venerable one, Lord, has a fistula, and Ākāsa-gotta the physician, has been lancing it.’

3. The Blessed Buddha rebuked (that Bhikkhu), saying, ‘This is improper, O Bhikkhus, for that foolish one, unbecoming, indecent, unworthy of Samanas, not allowable and ought not to be done. How can this foolish fellow, O Bhikkhus, allow a surgical operation to be performed in that part of his body? The skin there, O Bhikkhus, is tender, the wound is difficult to treat, the knife is difficult to guide. This will not redound, O Bhikkhus, to the conversion of the unconverted.’

And having rebuked him, the Blessed One, after delivering a religious discourse, said to the Bhikkhus: ‘You are not, O Bhikkhus, to allow a surgical operation to be performed upon you in that part of your bodies. Whosoever allows that, is guilty of *thullakāya* offence.’

4. Now at that time Khabbaggiya Bhikkhus, since a surgical operation had been forbidden by the Blessed One, used a clyster.

They told this thing to the Blessed One.

‘Is it true, as they say, O Bhikkhus, that the *Khabbaggiya* Bhikkhus use a clyster ?’

‘It is true, my Lord.’

He rebuked them, and having delivered a religious discourse, said to the Bhikkhus: ‘No surgical operation is to be performed within a distance of two inches round the anus, and a clyster is not to be used. Whoever does so, is guilty of a *thullakkaya* offence.’

And thus we find that Jivaka, the famous surgeon, is said to have cured a case of fistula-in-ano by the single application of an ointment.¹ The operation fell into such disuse that when Śaṅkarācāryya suffered from the same disease, no surgical aid was thought necessary by the physicians, though it is said that he was treated by renowned doctors of the time.²

From Megasthenes, we learn that “among the Sarmanas the Hylobioi (living in woods) were held in most honour, and next to them the physicians, who are mendicants and also ascetics, like the class above them and the class below them,

¹ “And Givaka Komārabhakkā healed the fistula of the Magadha King Seniya Bimbisāra by one anointing.”

Mohāvāgga (Sacred Books of the East), VIII. 1. 15.

² अचिकित्स्यभगन्दराग्न्यरोगप्रसरच्छीणितपङ्क्तिस्त्रयशब्दा ।

अनुगुप्त्यविशेषनादिरूपां परिचर्यामकृताऽस्य तीटकार्यः ॥

* * * * *

निगदिते मुनिनेति भिषग्वरा विदधिरे बहुधागदसत्क्रियाः ।

न च शशाम गदीवहुतापदीविमनसः पट्वी भिषजीऽभवन् ॥

which consisted of sorcerers and fortune-tellers;"¹ and Strabo² mentions that these physicians "cured diseases by diet rather than by medicinal remedies, which were chiefly unguents and cataplasms."³

6. No science can flourish without the support of the government of the day. The Hindūs became a subject race; and any departure from the traditional store of knowledge in the shape of improvement in the quality and additions to its quantity was neither tolerated by the people, who are proverbially conservative, nor countenanced by the royal court, for the conquerors brought with them and patronised their own hakeems and doctors. Neither the Mahomedans nor the English have taken any real interest in the Indian Medical Science from preconcieved notions that it contains nothing worthy of their perusal. The *Kavirajes* again are so conservative in their opinions that they can not boldly advocate even the use of such drugs as are of unquestionable value in the treatment of diseases, as for example the use of Quinine in Malaria. To this may be contrasted the behaviour of Bhāvamiśra, who lived about three hundred years back and who adopted many medicaments of foreign origin. The consequence can easily be imagined, and in the language of Elphinstone, can be thus described: "Physicians follow the practice of their instructor without inquiry, and surgery is so far neglected, that bleeding is left to the barber, bone-setting to the herdsman, and every one is ready to administer

¹ The Invasion of Alexander the Great, M'Crindle. Appendices. p. 358.

² Geography, XV. i. 58-60.

³ The Invasion of Alexander the Great, M'Crindle. Appendices. p. 368-69.

a blister, which is done with the juice of the cuphorbium and still oftner with the actual cautery.”¹

But we need not enlarge any further. The object of this essay is not to write out an exhaustive dissertation on the Hindu medical science but by a few suggestive facts, however imperfect and fragmentary, to stimulate curiosity and divert attention of the diligent scholars to a vast field of research, which seems as yet to have been only partially explored.

It is proper here to acknowledge that I have on all occasions freely availed myself of the labours of Drs. Wise, Thakore Saheb of Gondal, and the translators of *Suśruta Śāṁhitā* in the *Bibliotheca Indica*, namely, Dutt and Hoernle. It is a great pity that this translation has not as yet progressed beyond three fasciculi. Hoernle's recent contribution, “*Osteology of the Hindus*,” is a move in the right direction and we hope it to be followed by similar enquiries in other branches of the science. Royle for the first time proved beyond doubt the high antiquity of Hindu medicine, and established its right position in the history of the science. Wise is the pioneer of systematic research in this field of study, and his sympathetic appreciation of the Hindu system of medicine will always be remembered with gratitude by our countrymen. Dutt's *Materia Medica of the Hindus* is a work of great merit; and I have derived material assistance from the excellent treatise, “*History of Aryan Medical Science*,” by the Thakore Saheb of Gondal. Dr. Ray's *History of Hindu Chemistry* is a valuable contribution in the cognate subject of chemistry. I have borrowed from these writers largely, but

¹ Elphinstone's *History of India*, 5th Ed., p. 160.

I flatter myself it will also be found that I have further collected from various sources a store of valuable information, for which I am in no way indebted to any of my predecessors in the same field of research. The descriptions of the surgical instruments of the Greeks, the Romans and the Arabs, I have taken from the excellent English translations of Paulus Ægineta, the Extant Works of Ætius and the Genuine Works of Hippocrates, prepared by the renowned Adams, for the Sydenham Society. I have also laid the recent monograph, "Surgical instruments in Greek and Roman times" by Dr. Milne, largely under contribution; I only regret that I had no access to the book a little earlier, otherwise much of my labour in search for descriptions of the instruments of the Greeks would have been saved. For the last five years, I have been engaged on this investigation and it was when I had nearly finished, that Milne's book was mentioned to me by the Hon'ble Mr. Justice Asutosh Mookerjee, the Vice-Chancellor of the Calcutta University and the President of the Asiatic Society of Bengal.

To complete the subject, I have added plates of nearly all the varieties of instruments; but they are more or less hypothetical as we do not possess any actual specimens of the instruments of the Hindus. Written descriptions of surgical instruments are uninteresting and often fail to convey the true idea, which could be easily made evident by the pencil. For purposes of comparison I have given drawings of instruments of the Greeks, the Romans and the Arabs, when I thought that they might be of value for the proper elucidation of my subject. I am indebted to many authors

I am indebted to many authors for some of the engravings of the instruments. I have been careful to give the source whence the borrowed ones are taken, as far as I have been able to ascertain them. If this has been omitted in any case, it is from inadvertence, not from design. My best thanks are due to them and I here acknowledge my indebtedness to the authors for availing myself of their labours without their permission. But many new illustrations will be found, and I have appended my name to those drawn by myself. These figures of the surgical instruments would be found to tally better with the descriptions of the instruments given in the Sanskrit books than the illustrations of the previous authors. The drawings of surgical instruments as given by me would look more like the figures in a modern catalogue of surgical instruments. Some of my friends could hardly believe when they saw the plates that these instruments were known to the ancient Hindus at such an early age. This feeling of amazement and incredulity as regards the surgical instruments used by the ancient Hindus has its parallel in the observations of Billroth¹ about the surgical instruments found in the excavations at Pompeii and now preserved in the museum at Naples. He says: "It made a peculiar impression upon me, when I saw before me this two thousand years old surgical armamentarium of a Roman colleague, differing but slightly in the form of the more ordinary instruments from those of our time. *Ars longa vita brevis.*" Milne² also remarks: "The works of those (Paré, Scultetus and Heister) are profusely illustrated with instruments, some of which can plainly be seen to tally exactly with the descriptions of the classical authors."

¹ Billroth's Surgery, Vol. I, Introduction, Page 7. Syd. Soc. Ed.

² Græco-Roman Surgical Instruments, P. 8.

In describing the surgical instruments, I have confined myself strictly to the texts of the authors and commentators whom I have quoted, and have given the original Sanskrit passages in the foot-notes. These will be of great help to scholars who will try to study the subject at first hand, and prosecute further historical inquiries. The references in the foot-notes do not refer to pages of any particular edition of the work, as such pagination causes inconvenience to the readers who may not secure the edition in question; so we have given the section, and chapter of the book which will be found in any edition.

In the translations of Sanskrit passages, I have endeavoured to follow the original as closely as possible, except where a somewhat free rendering was necessary to make the meaning clear.

The dates of the ancient Hindu authors of Sanskrit medical books cannot be ascertained with certainty. In the first chapter I have endeavoured to discuss briefly their approximate ages. But as I have compared the surgical instruments of the ancient Hindus with those of the Greeks, Romans and Arabs, a concise summary of the chronological dates of the Græco-Roman, Arab, and the later authors would be a great help in the proper elucidation of my text.

<i>Authors.</i>	<i>Date.</i>
Pythagoras	580-504 B.C.
Megasthenes	300 B.C.
Ktesias	400 B.C.
Hippocrates	460 B.C.
Hero of Alexandria	285-222 B.C.

<i>Authors.</i>		<i>Date.</i>
Dioscorides	...	First century A.D.
Celsus	...	25-30 B.C. to 45-50 A.D.
Scribonius Largus	...	45 A.D.
Soranus	....	First century A.D.
Rufus of Ephesus	...	98-117 A.D.
Galen	...	131-201 A.D.
Marcellus Empiricus	...	300 A.D.
Antyllus	...	3rd century, A.D.
Oribasius	...	326-403 A.D.
Theodore Priscianus	...	4th century A.D.
Caelius Aurelianus	...	4th or 5th century A.D.
Moschion	...	5th century A.D.
Aetius...	...	5th century A.D.
Alexendar of Tralles	...	525-605 A.D.
Paulus Aegineta	..	660 A.D.
Serapion	...	800 A.D.
Rhazes	...	850-932 A.D.
Haly Abbas	...	After 950 A.D.
Avicenna	...	980-1037 A.D.
Abul Cassim	...	x 1106 A.D.
Avenzoar	...	x 1162 A.D.
Paré	...	1509-90 A.D.
Scultetus	...	1650 A.D.
Heister	...	1739 A.D.

I can not suffer this work to go forth without offering at least an explanation of, if not an apology for, the delay which has occurred in the publication of this thesis. It is mainly due to the accidental fire which reduced the types and the blocks

for this work to ashes and destroyed a part of the manuscript. This portion had to be written again. Again the task of reading proof sheets was laid on me entirely. The occupation of a laborious profession encroached on my time; and I was not fortunate enough to secure the co-operation of any worker in this field of research. The result might be anticipated and no one is more conscious of the unsatisfactory issue than myself. I had no experience in proof reading, and so mistakes are not uncommon. Some of the errors will be found corrected in the corrigenda. As regards the corrections of many of the proof sheets of the Sanskrit foot-notes I was assisted by my son Hirendranāth Mukhopādhyāya, who helped me much in getting this book completed. The author will feel obliged if informed of any errors that may be detected and of references to informations which ought to have been given, and also for any hints that may make a future edition more useful to the readers. But I have this consolation in my mind that I have not pushed this work through the press hurriedly or prefunctorily and I have done my best. I have laboured with the usual drawbacks of an active professional life and if this be admitted by the critic as an excuse for errors and failures, I shall be grateful to him.

A copious index has been provided for this work, whereby anything material in the whole book may be readily found out; of which it may be said that it wants no other advantages than such as the author had not power to give.

It would not be out of place here to mention that part of this essay was read before the Asiatic Society of Bengal in June, July and August, 1908. The learned President in his annual address remarked as follows: "In the course of the last

session Dr. Girindranath Mukerjee submitted to the society a paper of considerable extent, in which he elaborately examined the subject of the surgical instruments of the ancient Hindus. The questions he has raised, as to the priority of Hindu medicine over that of the Greeks, the Romans and the Arabs, are likely to arouse controversy, but in whatever way the question of priority may be decided, it seems to me truly remarkable that the descriptions given in our most ancient books on medicine, of the surgical Instruments then in use, should bear a close resemblance to the descriptions given not only in Greek, Roman and Arab medical writings but in many cases with the descriptions given in modern works on surgery. I trust that this subject, so peculiarly Indian, will not be left alone and will receive the attention from investigators which it undoubtedly deserves."¹

As regards the transliteration of Sanskrit words, we have employed the method adopted in the Congress of Orientalists and circulated in the Journal of the Royal Asiatic Society, ignoring in fact, the unpleasant characters of the Sacred Book of the East.

¹ Journal and Proceedings of the Asiatic Society of Bengal, Vol. V, 1909, Annual Address, p. XXX.

I

SANSKRIT AND ALLIED ALPHABETS.

अ a	ओ o	ट ṭ	ब b
आ ā	औ au	ठ ṭh	भ bh
इ i	क k	ड ḍ	म m
ई ī	ख kh	ढ ḍh	य y
उ u	ग g	ण ṇ	र r
ऊ ū	घ gh	त t	ल l
ऋ ṛ	ङ ṅ	थ th	व v
ॠ ṝ	च c	द d	श ś
ऌ ḷ	छ ch	ध dh	ष ṣ
ॡ ḹ	ज j	न n	स s
ए e	झ jh	प p	ह h
ऐ ai	ञ ñ	फ ph	ळ ḷ

˙ (Anusvāra) ṁ	ṣ (Avagraha) ˘
˘ (Anunāsika) ṃ	Udāta ˆ
: (Visarga) ḥ	Svarita ˜
× (Jihvāmūliya) ḥ	Anudāta ˘
∞ (Upadhmānīya) ḥ	

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and commentaries. Vāgbhaṭa I,—Aṣṭāṅga Saṁgraha, his age, edition and commentary; Vāgbhaṭ II: Aṣṭāṅga Hṛdaya Saṁhitā, editions and commentaries; Vagbhaṭā III—Rasa Ratna Samuccaya; Mādhavakara :—Nidāna; Vṛnda Madhava :—Siddhayoga; Cakrapāṇi-datta :—Cikitsāsāra Saṁgraha, editions; Śārāṅgadharma:—Śārāṅgadharma Saṁgraha, editions and commentary; Bhāva Miśra :—Bhava Prakāśa, editions.

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1. The Svastika yantra or cruciform Instruments:
 - Siṁhamukha svastika or Lion-faced forceps.
 - Vyāghramukha or Tiger forceps.
 - Vṛkamukha or Wolf forceps.
 - Tarakṣumukha or Hyena forceps.
 - Ṛkṣamukha or Bear forceps.
 - Dwipimukha or Panther forceps.
 - Mārjāramukha or Cat forceps.
 - Śṛgālamukha or Jackal forceps.
 - Airbbāruka or Deer forceps.
 - Kākamukha or Crow forceps.
 - Kaṅkamukha or Heron forceps.
 - Kuraramukha or Osprey forceps.
 - Cāsamukha or Blue-Jay forceps.
 - Bhāsamukha or Eagle forceps.
 - Śaśaghātīmukha or Hawk forceps.
 - Ulukamukha or owl forceps.
 - Cillimukha or Kite forceps.
 - Syenamukha or Vulture forceps.
 - Gr̥dhramukha or Falcon forceps.

Krauñcamukha or Curlew forceps. Bhṛūgarāja-mukha or Butcher-bird forceps. Añjalikarṇa forceps. Avabhañjanamukha forceps. Nandimukha forceps. II. The Sandaṁśa or Pincher-like forceps: Forceps with and without handles. Forceps with Smooth and rough ends. Epilation forceps. Mucutī or Mucundī. Vaṁśabidala or Bamboo forceps. III. Tāla-Yantra or Picklock-like instrument: Eetāla and Dvitāla. The Ear-scoop. IV. The Naḍi-Yantra or Tubular instruments: Kaṇṭhaśalyāvalokinī or Throat speculum. Pañcamuka and Trimukha. Tubular instruments for inspection of arrows. Śalyanirghātani. The Impellent. Tubular instruments for Piles—for inspection and medication. Śamī. The Rectal Speculum. Calopter. Tubular instruments for the Fistula-in-ano. Tubular instruments for the nose: Nasal Speculum. Nathu-karani and Yamaka-nathu-karani. Nasal tubes. The Aṅguli-trāṇaka or Finger-guard. Yoni-Vraṇekṣana or Vaginal Speculum. Diopter. Bivalve Speculum. The tubular instruments for wounds—Vraṇa-vasti or Wound-Syringe. Tubular instrument for ascites. Dākodara yantra or Canula. Tubular instruments for Hydrocele. Tubular instruments for rectal stricture. Tubular instruments for injection into the rectum—Vasti Yantra or Rectal clyster. Uttaravasti or urethral, vaginal and uterine tubes. Catheters. Tubular instruments for inhalation and fumigation. Disinfection of rooms, clothes &c. Tubular instruments for cupping. Śṛṅga or horn. Alābu Yantra or gourd. Ghati Yantra. V. Śalakā	
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or rods: Earthworm probes. Arrow probe. Snake's hood probe. Fish-hook probes. The Śaṅku; Swab probe. Spathomele or spatula probe. Spoon-shaped probes. Cyathiscomele. Nail-shaped probes. Jāmvavauṣṭha probe. Gamma-shaped probe and the aṅkuśa cautery. Collyrium probes. Karṇa Śodhana or Ear-cleaner. Garbha-Śaṅku or Fetus or Traction hook. Yujña-Śaṅku or Midwifery forceps. Sarpa-faṇa or snake's hood-like rods. Stone extractor. Hippocratic oath. Sarapuṅkha-mukha Probe. Arddhacandramukha or Half-moon Probe. Bone Lever. Director. Urethral Probe. VI. The Upayantra or Accessory Instruments. Rajju or thread, Venikā or twine; Paṭṭa or Bandages, Abdominal binder, Field Hospital, Dressings. Carma or leather: leather bandage, leather ligatures. Yantra-Śaṭaka or Lithotomy Strap or binding apparatus, Pāśa. Leather bags. Śīrovasti or leather-bag for the head. Leather Band. Leather Bottles, Jars, etc. Antarvalkala or Barks. The crutches, Tendrils of creepers or Latā. Vastra or cloth. Aṣṭhilāṣma or stone. Mudgara or Hammer. Pāṇipadātala or hand and foot. Aṅguli or fingers. Jihvā or tongue. Danta or tooth. Nakha or nails. Mukha or mouth. Vāla or hair. Probang. Suture material. Aśvakāṭaka or the ring of a horse's bridle. Śākhā or branch of a tree. Sṭhivana or spittle. Pravāhana or fluxing the patient. •Har a or Happiness. Ayaskānta or Load-stone. Kṣāra or Caustics or Potential cautery. Agni or Actual cautery. Bheṣaja or medicines. Goats' gut; Arrest of hæmorrhage.

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Page	ii		F. N. 3		
"	xi	Para 5			
"	xi		F. N. 1		
"	xiii		" 1	read	Mahāvagga for Mohāvagga.
"	82	line 4	" 1		
"	116	" 23	" 5		
"	182	" 10, 15	" 2		
"	x	" 10			
"	202	" 1 of para. 5			
"	203	" 2 & last line			
"	262	" 12		"	diagnosis .. diagonosis.
"	306		" 1		
"	317	" 10			
"	319		" 3		
"	320	" 5	" 1		
"	xiii		" 2	"	Vijoya .. Vejoya.
"	xv				Bibliotheca .. Bibliotheca.
"	3		" 1 & 2	"	Macdonell .. Macdonnel.
"	303		" 1		
"	4		" 1	"	Dārila .. Dārila.
"	17	" 7		"	Bhānumati .. Vānumati.
"	27	item 8		"	Rabi .. Robi.
"	30		" 1	"	Archæo .. Archæo.
"	12		" 3	"	Śārngadhara .. Śārngadhara.
"	31			"	
"	35	" 13		"	Skilful .. Skillful.
"	40	" 8		"	Sesame .. Sesame.
"	37	" 11		"	Bhūrjja .. Bhūrjya.
"	39	" 23		"	Water and .. Water,
"	40	" 14			Mortar .. Mortar.
"	70		" 3	"	Vṛddha .. Vṛddhya.
"	71		" 1 & 3	"	
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"	88	" 13		"	Pālākāpya .. Pālākāpya.
"	99	" 8		"	Śalya .. Śalya.
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page 159	line 18	...	read	Jāmvovanṣṭha	for	Jamvovonṣṭha.
" 178	item 10	...	"	Cīna	"	China.
" 181	...	" 2	"	Obstetric	"	Obstetire.
" 196	line 12	...	"	Gayadāsa	"	Gayadāssa.
" 219	" 14	...	"	Sesamum	"	Seasum.
" 219	" 21	...	"	effectual	"	offectual.
" 221	item 3	...	"	Pācana	"	Pāchana.
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" 262	" 10	...	"	Round...four	"	four cornered...
				cornered	round.
" 285	" 15	...	"	Hippo	"	Hyppo.
" 295	" 3	...	"	Requisites	"	Requisities.
" 306	" 11	...	"	Yaṣṭhi	"	Yaṣṭi.
" 311	item 2	...	"	octagonal	"	octogonal.
" 328	" 3	...	"	hātā	"	hata.
" 331	line 18	...	"	Jolly	"	Jolley.
" 340	" 5	...	"	Physician	"	Physian.
" 346	" 18	...	"	amber	"	ambar.
" 348	" 2	...	"	Paitanaha	"	Paitāmoha.
" 352	" 22	...	"	Firoz	"	Firroz.
" 354	" 11	...	"	Areca	"	Arecha.
" 355	" 12	...	"	Dvārusita	"	Davrusita.

WORKS BY THE AUTHOR.

1. Muscles of the Human Body, arranged in Tabular forms.
Fourth Edition. Re. 1

2. Tropical Abscess of the Liver.

Thesis approved for the degree of Doctorate in Medicine,
Madras University. Rs. 5

3. Glossary of Indigenous Medicinal Plants.

(In the Press)

4. Notices, Biographical and Bibliographical, of the Indian
Physicians and their Works on Medicine.

(In the Press)

5. Medicine in the Vedic times.

(In preparation)

**THE STAR MEDICAL HALL,
80, Russa Road North, Bhawanipur,
CALCUTTA.**

THE Surgical Instruments of the Hindus.

CHAPTER I.

INTRODUCTION.

ANCIENT MEDICAL AUTHORS AND THEIR WORKS.

The Science and Art of Medicine, like many other different branches of learning originated with the Hindus. They consider the art of healing as an Upaveda and it is generally known as Āyurveda, that is the art of prolonging life. Like the Vedas, they trace the origin of the science to God, the fountain of all true knowledge. Bramhā transmitted this heaven-born science to this world for benefit of the mortals in one of the sacred writings, the Āyurveda.

It was composed as a sub-division of the Atharva Veda and consisted originally of a *lākṣ slokas* or a hundred thousand stanzas, divided into a thousand chapters. Then considering the short span of life and inadequate intelligence of man, he divided the book into eight parts¹ as follows:—

¹ तद्यथा ॥ शल्यं शालाक्यं कायचिकित्सां भूतविद्यां कौमारभृत्यमगदतन्त्रम्
रसायनतन्त्रं वाजीकरणतन्त्रमिति ॥

Suśruta Saṁhitā, I. i.

कायचिकित्सां शालाक्यं शल्यहर्तृकं विषगरवैरीधिकप्रशमनं भूतविद्यां कौमारभृत्यकं
रसायनानि वाजीकरणमिति ।

Caraka Saṁhitā, I. xxx.

वेदी ह्याध्वर्यवः स्वस्थयनवलिमङ्गलहीमनियमप्रायश्चित्तोपवासमन्त्रादिपरिग्रहात् चिकित्सां
प्राह ।

Ibid.

1. Śalya Tantra or Major Surgery.
2. Śālākya Tantra or Surgery of parts above the Clavicles.
3. Kēya Cikitsā or Inner Medicine.
4. Bhūtvidyā or Demnology.
5. Kaumārabhr̥tya or the Science of Paediatrics.
6. Agada or Toxicology.
7. Rasāyana or Treatment to prolong life.
8. Vājikaraṇa or Treatment to stimulate the sexual power.

The book is no more available now, Suśruta being the authority for the above information.¹

A different view is held by others, who trace the origin of Hindu Medicine in the verses of the R̥gveda.²

¹ इह खल्वायुर्वेदी नाम यदुपाङ्गमथर्ववेदसंज्ञात्पादैव प्रजाः श्लोकशतसहस्र-
मध्यायसहस्रञ्च कृतवान् स्वयम्भूः । ततोऽस्यायुद्धमल्पमेधस्ताञ्चावलीक्य नराणां भूयोऽष्टधा
प्रणीतवान् ॥

Suśruta Saṁhitā, I. i.

तत्र चेत् प्रष्टारः स्याः चतुर्णां ह्येकसामयजुरथर्ववेदानां कं वेदमुपदिशन्त्यायुर्वेदविदः ।
किमायुः कम्पादायुर्वेदः किञ्चायमायुर्वेदः शाश्वतोऽशाश्वत इति । कानि चासंज्ञानि
कशायमध्वरातयः किमर्थं चेति ॥

तत्र भिषजा वृष्टे नैवं चतुर्णां ह्येकसामयजुरथर्ववेदानाम् आत्मनोऽथर्ववेदे भक्तिरादिश्या ।

Caraka Saṁhitā, I. xxx.

The origin of medical science, as quoted in the above passage of Caraka, does not however agree with the view expressed by the author in the Sūtra Sthāna, Ch. I. (See footnote 1. P. 4). In Ch. XXX, we find that an attempt had been made to make a compromise between the two views of Agniveśa and Suśruta. Evidently this was the work of a later redactor, possibly Dr̥dhavala.

न ह्यायुर्वेदसंज्ञाभूतीतिरूपलभ्यते । अन्यत्राववीधीपदेशाभ्यामेतद्वै द्वयमधिकृत्य उत्पत्ति-
मुपदिशत्येके स्वाभाविकञ्चासौ लक्षणमधिकृत्य यदुक्तम् इह चाद्येचाध्याये * * * ॥

Caraka Saṁhitā, I. xxx.

² ऋग्वेदसंज्ञायां वेद उपवेदः ।

Carana Vyūha by Vyāsa.

ATHARVA VEDA.

“On examining the contents of the Atharva Veda more in detail, we find that the hostile charms it contains are directed largely against various diseases or the demons which are supposed to cause them. There are spells to cure fever (takmān), leprosy, jaundice, dropsy, scrofula, cough, ophthalmia, baldness, lack of vital power, fractures and wounds; the bite of snakes or injurious insects, and poison in general; mania and other ailments. These charms are accompanied by the employment of appropriate herbs. Hence the Atharva Veda is the oldest literary monument of Indian Medicine.”¹ This Veda can not belong to a period later than 1000 B. C., but possibly earlier.² It exists in the recensions of two different schools. That of the Paippalāda is only known in manuscript, discovered by Prof. Buhler in Kashmir and described by Prof. Roth in his tract *Der Atharva Veda in Kaschmir* (1875). The printed text, edited by Roth and Whitney in Berlin 1856, gives the recension of the Śaunaka School.³ It has been translated into English Prose by Whitney, 2 Vols.; into English verse by Griffith, 2 Vols., Benares, 1897, and with the omission of the unimportant

¹ McDonnell's Sanskrit Literature, P. 196.

अथर्ववेदस्य * * * * चतुर्थं वेदत्वेऽपि प्रायिणाभिचारवर्धत्वाद्यज्ञविद्यायामनुप-
योगाच्चानिर्देशः । तथाहि ऋग्वेदेनैव ह्रीं कुर्वन् यजुर्वेदेनाध्वर्यवं सामवेदेनौद्गात्रं
यदेव चयै विद्याय सृक्तन्ते ब्रह्मत्वमिति श्रुते स्त्रयीसम्पाद्यत्वं यजानां ज्ञायते ।

Kaṭhaka Bhaṭṭa's Commentary on Manu Saṁhitā, Ch. III, Śloka I.

² On the date of Atharva Veda, see pp. CXL—CLXI, Prof. Lanman's Edition of Whitney's Transl.; Prof. McDonnell's Sanskrit Literature, pp. 185—201.

³ Index Vervorum in the Journal of the Am. Or. Soc. Vol. XII.

hymns, by Bloomfield¹ into English Prose, with notes, in Vol. XLIII of the Sacred Books of the East.

CARAKA SĀMĤITĀ.

In the Caraka Sāmhita we find that Brahmā taught Dakṣa the science of medicine; Dakṣa became the preceptor of the Aśvin twins; they in their turn became the teachers of Indra and Indra imparted this knowledge to Bharadvāja who was sent by a conclave of sages to learn the art for the welfare of the human race.² Bharadvāja had Punarvasu Ātreya and the others as disciples. Ātreya's students were Agniveśa, Bhela, Jatukarṇa, Parāśara, Hārīta and Kṣārapaṇi, all of whom became celebrated as the authors of treatises on Medicine; the Caraka Sāmhita being a revised and improved edition of the treatise of Agniveśa, which was declared to be the best production.³ Caraka did not, however, redact the whole

¹ He has also edited the Kauśika Sūtra of the Atharva Veda, with extracts from the commentaries of Dārīta and Keśava (see Vol. XIV Journ. Am. Orient. Soc.). It is very useful as a help to the proper understanding of the meaning of a hymn.

² दीर्घक्रीवितमखिच्छन् भरद्वाज उपागमत् ।

ब्रह्ममुद्यतपा बुद्धा शरण्यममरश्चरम् ॥

ब्रह्मणा हि यथा प्रोक्तमायुर्ज्वदं प्रजापतिः ।

जयाह निखिलनादावश्विनो तु पुनस्ततः ॥

अश्विभ्यां भगवान् शक्रः प्रतिपदं ह केवलम् ।

ऋषिप्रोक्ता भरद्वाजस्तस्माच्छक्रमुपागमत् ॥

Caraka Sāmhita, I. i.

³ अथ सन्धीपरः पुण्यमायुर्ज्वदं पुनर्ज्वसुः ।

शिष्येभ्यो दत्तवान् षडभ्यः सञ्ज्वन्तानुकांक्षया ॥

अग्निर्विश्वं भेलय जतुकर्णः पराशरः ।

हारीतः चारपाणिश्च जगद्भुक्तमुनेर्वचः ॥

बुद्धेर्विशेषस्तवासीन्नीपदेशालरं मुनेः ।

तन्मस्य कर्त्ता प्रथममग्निर्वशी यतीऽभवत् ॥

अथ भेलादयश्चक्रुः स्वं स्वं तन्मं कृतानि च ।

श्रावयामासुरावेयं सर्पिसङ्गं मुनेधसः ॥

Ibid, I. i.

book;—the last forty-four chapters¹ were edited by Drḍhavalā,² a native of Panchanadapura, long supposed to refer to Punjab (the land of five rivers) but at present identified with a town in Kashmir by Dr. Hoernle.³ Two other works, the treatises of Bhela and Hārīta, are still extant; the former existing in manuscript in the Tanjore Library⁴ and the latter as printed texts by *Kavirājes* K. C. Sen and B. L. Sen, of Calcutta.⁵

Now as regards the age of Caraka, there is great divergence of opinions. The Indians generally believe him to be a Ṛṣi of great antiquity while the European scholars try

¹ For a discussion on the part added by Drḍhavalā, see Hoernle's *Studies in Ancient Indian Medicine*, J. R. A. S. 1908, P. 997-1002. Also see pp. 11-15 in the *Vanaśadhī Darpaṇa*, Vol. I., by Kavirāja Birajā Charan Gupta, 1908.

² अतस्तन्नीचममिदं चरकेणातिवृद्धिना ।

संस्कृतं तत् तु संसृष्टं विभागेनीपलक्ष्यते ॥

इदमन्यूनशब्दार्थं तन्न दीषविवर्जितं ।

अखण्डार्थं दृढवली जातः पञ्चनदे पूरे ॥

कृत्वा बहुभ्यस्तन्नेभ्यो विशेषाच्च वलीचयम् ।

सप्तदशोषधाध्यायसिद्धिकल्पैरपूरयत् ॥

Caraka Saṁhitā, VIII, xii.

अस्मिन् सप्तदशाध्यायाः कल्पाः सिद्धय एव च ।

नासाद्यन्तेऽग्निवेशस्य तन्ने चरकसंस्कृते ॥

तानेतान् कापिलवलः शेषान् दृढवलीऽकरोत् ।

तन्नस्यास्य महार्थस्य पूरणार्थं यथातथम् ॥

Ibid, VI, xxx.

³ Hoernle's *Studies in the Medicine of Ancient India*, Part I, Osteology, Introduction, p. 2. See also his article on "The authorship of Caraka Saṁhitā" in the *Archiv für die Geschichte der Medizin*, 1907.

⁴ See Burnell's Tanjore Catalogue No. 10773 of Sanskrit Mss., P. 63.

⁵ It is doubtful whether the Hārīta Saṁhitā is the genuine work of the Ṛṣi, Hārīta. The printed text refers to Caraka, Suśruta and even Vāgbhaṭa, who were decidedly posterior to Hārīta, See the Footnote 3, P. 6.

to connect him with historical events of more modern times. Sylvain Lévi has recently discovered in the Chinese Translation of the Buddhist *Tripitaka* that Caraka was the Court Physician of the Indo-Scythian King Kaniṣka, in the first century A.D.¹ But the following objections are to be met with before his conclusions can be accepted as proved :—

1. The age of Kaniṣka is not yet settled, the probable limits of his reign being from the first century B. C. to the second century A. D.² Moreover in the Buddhist *Tripitaka* referred to, the name of Caraka is simply mentioned as the Court Physician of the King Kaniṣka but there is nothing to identify him with the author of the book. The same name, found in different places, does by no means signify the same person.

2. The time assigned to Caraka by the Indian medical tradition is of great antiquity. With regard to the chronological position of the three old authors, he is mentioned as anterior to Suśruta and Vāgbhaṭa I.³

3. Dr. Rāy has pointed out that the name Caraka is patronymic in the Veda.⁴ It is quite possible that a much

¹ See *Journal Asiatique*—July to December 1896, p. 444 to 484 and January to June 1897, p. 5 to 42; also *Indian Antiquary* Vol. XXXII, 1903, p. 382 and *Viena Oriental Journal*, Vol. XI., p. 164.

² See V. A. Smith's *Early History of India*, P. 225-26.

Dr. Fleet in *J. R. A. S.*, 1906, P. 979.

Dr. Bhandarkar in *J. R. A. S. (Bombay Branch)*, Vol. XX, P. 269.

J. A. S. B. Vol. XXXIX, 1870, p. 65 and 126.

³ चरकः सुश्रुतश्चैव वाग्भटश्च तथापरः ।
 सुख्याश्च संहिता वाच्यामिष एव युगे युगे ॥
 अत्रिः कृतयुगे वैद्यो दापरी सुश्रुती मतः ।
 कलौ वाग्भटनामा च गरिमाव प्रदृश्यते ।

Hārta Saṁhitā, Pariśiṣṭādhāya.

⁴ Dr. P. C. Rāy's *History of Hindu Chemistry*, Introduction, P. X.

later namesake of his, is referred to by the *Tripitāka*, just as we know that more than one Vāgbhaṭa appeared as successful physician. Again we have evidence that eminent physicians in later times were called Caraka by way of a compliment and so Vāgbhaṭa was called Caraka of Sindh or Sindhicara.

4. Pāṇini wrote special Sūtras for the Agniveśas and the Carakas.¹ These names must have been famous before Pāṇini's time, otherwise he would not have written special Sūtras for them. Prof. Goldstucker has conclusively proved that Pāṇini could not have flourished later than the sixth century B. C.²

5. Patañjali wrote a commentary on Caraka.³ He flourished during the second century B. C. Both Cakrapāṇi-datta and Bhoja allude to him as the redactor of Caraka Saṁhitā.⁴ So Caraka must have flourished long before him, for unless his work was regarded as a standard work of authority, Patañjali would not have taken so much pains to write notes on the book, and still more for issuing a redaction.

6. The internal evidence of the book itself speaks against such an assumption. There is no salutation to any deity at the

¹ कटचरकाङ्गक । Pāṇini 4. 3. 107.

गर्गादिभ्यो यञ्च ॥ Ibid, 4. 1. 105.

गर्ग । वत्स । * * * * अग्निवेश * * * * पराशर । जतुकर्ण । * * * .

² Goldstucker's Pāṇini ; and Journal of the Asiatic Society of Bengal, Vol. XLII, P. 254.

³ आशीनाम अनुभवेन वस्तुतत्त्वस्य कात्स्न्येन निश्चयवान्, रागादिवशादपि नान्यथावादी यः स इति चरके पतञ्जलिः ।

Quoted in Laghumañjuṣā of Nāgeśa Bhaṭṭa (Rāy).

⁴ पातञ्जल—महामाथ्य—चरकप्रतिसंस्कृतेः ।

मनीवाक्-कायदीषाणाम् हर्षेऽहिपतये नमः ॥

Vide salutation in the Āyurvedārthadīpikā.

beginning of the book,—a custom invariably found to be observed in the more modern compilations. There is complete absence of Paurāṇic theology in the Caraka Saṁhitā, nor is there any reference to Śākya Muni and his religion. Kanīṣka was a great patron of Buddhism, and it might naturally be expected from the Court Physician of the king to describe the charitable hospitals which we know from the edict of Aśoka, to have flourished in every quarter of India. On the contrary we find descriptions of a hospital as reserved for rich men only at their own houses. Those gods and goddesses that figure so prominently in the Purāṇas were unknown during his time.¹ Beef was not then, apparently, a

¹ No doubt the names of Lākṣmī, Kṛṣṇa and Vāsudeva occur in Cikitsita Sthānam, Chapter XXV, but it should be remembered that they occur in the Supplement added by Dṛḍhavalā in later times.

सर्व्वं यद्वा न तव प्रभवन्ति न चाग्निश्चस्वरूपचोराः ।

लक्ष्मीश्च तव भजते यव महागन्धहृत्स्थिति ॥

पितृमाणा इमञ्चाव सिद्धं सन्धमूदीरयेत् ।

सम माता जया नाम विजयी नाम मे पिता ॥

सोऽहं जयी जयापुत्री विजयीऽथ जयामि च ।

नमः पुरुषसिंहाय विष्णवे विश्वकर्मेणे ॥

सनातनाय कृणाय भवाय विभवाय च ।

तेजो वषाकपेः साक्षात् तेजो ब्रह्मेन्द्रयीर्थमे ॥

यथाहं नाभिजानामि वासुदेवपराजयम् ।

Caraka Saṁhitā, VI, xxv.

But, Kṛṣṇa and Vāsudeva are mentioned in Pāṇini as demigods, having many adherents who formed a class. “वासुदेवार्जुनाभ्यां वुन” Pāṇini, 4. 3. 98. Again the passage may be an interpolation of a subsequent *Vaiṣṇava Vaid*.

So Bṛṣavadhvaṇa is also mentioned in Dṛḍhavalā's Supplement, as a god to be worshipped during the preparation of some medicines :

ब्रह्मघोषशङ्खपटहभरीनिनादेः सिद्धं सितच्छवकृतच्छायं गजस्कन्धमारीपयेद्भगवन्तं
वृषभजसमिपूज्य तं खेहं विभागमाचिकमङ्गलाशीः स्तुतिदेवता च नैर्वर्त्तिं गमयेत् ॥

Ibid, VIII, xii.

forbidden food, for it is spoken of as an article of diet that should not be indulged daily,¹ nor should it be used in excessive quantity as it is mentioned as a cause of the disease, Vāta-Rakta.²

The style of the book is antiquated and decidedly savours that of the Brāhmaṇas. Nāya and Vaiśeṣiki systems occur in the text,³ and so probably the book was written long before the compilation of these Sūtras.

Editions.—The book had undergone several editions. It was edited by Jibānanda Vidyāsāgar, Calcutta, in 1877 and 1896 (2nd Ed.) ; by Gaṅgādhar Kaviratna, Berhampur, 1879 ; by Gupta, Calcutta, 1897 ; with commentary by Cakrapāṇidatta, Calcutta, 1892-93 ; by Jaśodānandana Sarkār, with Bengali translation, 1894.

Translations.—It had been translated into English by A. C. Kaviratna, Calcutta, 1897. Caraka was translated from Sanskrit

And we find that the antidote to poison called महागन्धहृत् is said to have been told by Tryambaka (Śiva) to Baiśravaṇa (Kuvera):

अगदीऽखं वैश्रवणाख्यातन्यस्वकेण षट्पङ्कः ।

Caraka Samhitā, VI. xxv.

Also we find the name of Kārttikeya mentioned in Sec. IV. ch. viii.

प्रसुव त्वमिक्तिष्टमिक्तिष्टा शुभानने,

कार्तिकेयदुतिं पुत्रं कार्तिकेयामिरक्षितमिति ॥

¹ कुर्विकांश्च किलाटांश्च शीकरं गव्यमामिषं ।

मत्नान् दधि च माषांश्च यावकांश्च न शीलयेत् ॥

Ibid, I. v.

² कुलथमाषनिष्पावशाकादिपललेक्षुभिः ।

दध्नारनालसौवीरयुक्तक्रसुरासवैः ॥

Ibid, VI. xxix.

³ Vide Caraka, III. viii.

into Arabic in the beginning of the eighth century and his name "Sharaka Indianus" occurs in the Latin translations of Avicenna, Rhazes and Serapion. "A translation of the Karaka¹ from Sanskrit into Persian and from Persian into Arabic is mentioned in the Fihrist, (Finished 987 A.D.). It is likewise mentioned by Albērūnī²; the translation is said to have been made for the Barmekides."³ Albērūnī's chief source on Medicine was "Caraka, in the Arabic Edition of Ali Ibn Zain, from Trabaristan."⁴

Commentaries.—

1. Patañjali—2nd century B.C.—not available.
2. Cakrapāṇidatta's Caraka Tātparya Tikā, or Āyurveda-dīpikā⁵—1060 A.D.
3. Haricandra⁶—1111 A.D.—not available.
4. Śibadāsa's Caraka-Tattva-Pradīpikā.
5. Gaṅgādhar's Jalpa-Kalpa-Taru—1879 A.D.

¹ Proceedings of the As. Soc., Bengal, 1870, September.

² Reinaud, *Memoire sur l'Inde*, P. 316.

³ Maxmuller's Science of Language, Vol. I., P. 168, Foot Note.

⁴ Sachau's preface to India, P. XL.

⁵ See Caraka Saṁhitā with Cakrapāṇidatta's Commentary by *Kaṣirāja* Harināth Viśārada, Calcutta, 1895.

⁶ A Commentary written by Haricandra is referred to in the Sanskrit Slokas narrating the geneology of Maheśvara, the author of Viśvaprakāśa and Sāhasāṅkacarita, who flourished during the reign of Sāhasāṅka, king of Gazipur in 1033 Saka (1111 A. D. Wilson).

श्रीसाहस्राक्षरुपतेरखवदविद्य-

वेद्योत्तरङ्ग पदपद्धतिमेव विभक्तु ।

यस्यन्द्रचारुचरिती हरिचन्द्रनामा

सुवर्णाख्यया चरकतत्त्वमञ्चकार ॥

SUŚRUTA SAMHITĀ.

The next treatise on Hindu Medicine is the Suśruta Samhita. Suśruta was the son of the sage Viśvāmitra,¹ a contemporary of Rāma. He learned the Science of Medicine from Divodāsa, surnamed Dhanvantari, king of Benares, at his Himalayan retreat. According to Suśruta, Divodāsa was the incarnation of Dhanvantari, the celebrated physician of the gods in heaven, and he first propounded the Art of Healing in this world.² Suśruta represented the Surgical School while Caraka was pre-eminently a Physician in practice.

As regards the authorship of the book, opinions differ. To Suśruta, Dhanvantari addressed his lectures on Major Surgery,³

¹ Mahābhārata, Ānuśāṣana Parva, Ch. 139, Vs. 8-11.

धन्वन्तरिर्धर्मभृतां वरिष्ठी वाग्बिभारदः ।

विश्वामित्रात्मजमृषि शिष्यं सुश्रुतमश्वशात् ॥

Suśruta Samhita, V. ii.

अष्टाङ्गयज्वेदविदं दिवीदासं महामतिं ।

किन्नशास्त्रार्थसन्देहं सूक्ष्मागाधमिवोदधिं ।

विश्वामित्रमुतः श्रीमान् सुश्रुतः परिपुष्कति ।

Ibid, VI. lxvi.

सर्वशास्त्रार्थतत्त्वज्ञः क्षपीडष्टि रुदारधीः ।

वैश्वामित्रं शशासाय शिष्यं काश्रिपतिर्मुनिः ॥

Ibid, VI. xxviii.

² अथ खलु भगवन्तममरवरमृषिगणपरिष्ठितमाश्रमस्थं काशिराजं दिवीदासं धन्वन्तरि-
मोपध्वनवैतरणीरभपोक्तालावतकरवीर्यमीपुररक्षितमुश्रुतप्रभृतय ऊचुः ।

Ibid, I. i.

³ अत्र कथं किमुच्यतामिति । त ऊचुः । अस्माकं सर्वेषामेव शल्यज्ञानमूलं
ऋत्वीपदिशतु भगवानिति । स उवाचैवमस्मिन्ति । अस्माकमेकमतीनां मतमभिसमोऽयं
सुश्रुतो भगवन्तं प्रत्यति ।

Ibid, I. i.

which he reproduced in this work. But in the opening lines of the book, salutation is offered to Brahmā, Dakṣa, Aśvins, Indra, Dhanyantari, Suśruta and others.¹ This shows that Suśruta can not be the author of the work or at least of the work in its present shape, for no author can offer salutation to himself. By "the others" are no doubt meant the notable surgeons who practised and taught the Science of Surgery and who were either contemporary with or posterior to Suśruta. Possibly the original Suśruta Saṁhitā had been recast and the redactor could appropriately offer a salutation to the original author and to other surgeons who flourished before him. There is also an Indian medical tradition, noted in Dallanācārya's Commentary, which assigns the improved and supplemented edition of Suśruta's original work to Nāgārjūna,² the celebrated Buddhist Chemist, who is said to have been a contemporary of the king Sātvaḥana.³

In the third chapter, Suśruta enumerates the subjects described by him,—the chapter forming an index of the book. Therein he mentions the five principal divisions of his book and says that the Uttara Tantra or the Supplement would be

¹ नमो ब्रह्मप्रजापत्यशिववलभिड्वन्तरिसुश्रुतप्रसूतिभ्यः ।

Suśruta Saṁhitā, I.

² यत्र यत्र परीक्षे निधीगस्तत्र तत्रैव प्रतिसंस्कर्तृसूदं ज्ञातव्यमिति । प्रतिसंस्कर्तापीडनागार्जून एव ।

Dallanācārya's Commentary to Suśruta, I. i.

See also Dr. Cordier's *Recentes Decouvertes*, pp. 12-13.

³ See *Harṣacarita* by Vāṇa.

Beal's *Buddhist Records of the Western World*, Vol II., P. 209, 212, 216.
Burgess' *Archæological Survey of S. India*.

Intro. a l'histoire du Budh. Ind., P. 508.

described afterwards.¹ Now the fact that the sixth part was appended to the work as a Supplement or Uttara Tantra (i.e., after treatise) clearly shows that it was written afterwards by another surgeon and added to the original treatise. If the original Suśruta wished to have six divisions of his book, he would have mentioned it clearly in the index and would not have, after stating that his book consisted of five parts, added that "the Supplement would be described afterwards,"² which seems to be an interpolation of the Supplementor to pass his edition as the original work of the author. Again at the end of the fifth section, there is a passage describing the importance of the Āyurveda, which was meant as the conclusion of the book by the author.³ It is to be noted

¹ प्रागभिहितं सविंशमध्यायशतं पञ्चसु स्थानेषु । तत्र सूत्रस्थानमध्यायाः षट्चत्वारिंशत् ।
षोडश निदानानि । दश शरीराणि । चत्वारिंशच्चिकित्सितानि । अष्टौ कल्पाः । तदुत्तरं
षट्षष्टिः ।

अध्यायानां शतं विंशमेवमेतदुदीरितम् ।

अतः परं सनात्मेव तन्मुत्तरमुच्यते ॥

Suśruta Saṁhitā, I. iii.

² बीजं चिकित्सितमैतत् समासेन प्रकीर्तितम् ।

सविंशमध्यायशतमस्य व्याख्या भविष्यति ॥

तच्च सविंशमध्यायशतं पञ्चसु स्थानेषु । तत्र सूत्रस्थाननिदानशरीरचिकित्सितकल्पे-
ष्वर्थवशात् संविभज्योत्तरे तन्ने शेषानर्थान् व्याख्यायासामः ।

Ibid, I. i.

³ सविंशमध्यायशतमेतदुक्तं विभागश्च ।

इहोद्दिष्टाननिर्द्दिष्टान्सर्वान् वक्ष्याम्यधीत्तरे ॥

सनातनत्वाद्देदानामचरत्वात्तथैव च ॥

तथा दृष्टफलत्वाच्च हितत्वादपि देहिनां ।

वाक्समूहार्थविसारात् पूजितत्वाच्च देहिभिः ॥

चिकित्सितात्पुण्यतमं न किञ्चिदपि सुश्रुत ।

ऋषेरिन्द्रप्रभावसग्राह्यतयिनेर्भिषग्गुरोः ॥

धारयित्वा तु विमलं मतम् परमसम्मतं ।

उक्ताहार समाचारैर्ह प्रेत्य च मीदते ॥

Ibid, V. viii.

that at the end of no other sections do we find a similar passage. He also writes: "Thus one hundred and twenty chapters are described" but adds: "The other diseases shall be described in the Uttara Tantra": the latter part no doubt is an interpolation of the Supplementor. Moreover, in the opening lines which serve as a preface to the sixth part, the authority quoted for the diseases of the eye is Nimi, the king Janaka of Mithilā and not Dhanvantari.¹ But in the first chapter of the first section, it is described that the sages wanted Dhanvantari to teach them Śalyatantra or Major Surgery only and he consented to their request. And this subject he treated in detail in the five sections of the book. In the Supplement, on the other hand, are described the other branches of the science such as Minor Surgery, Inner Medicine, &c. Probably this part was added afterwards to give completeness to the treatise; and the original Suśruta was called Vṛddhya or the Old by the commentators to distinguish him from the Supplementor.

Suśruta's work is specially important to us as having two whole chapters (vii and viii of Section I.) devoted to the descriptions of Surgical Instruments and one whole chapter (xxv of Section I.) to the principles of Surgical Operations.

The age of Suśruta is also involved in obscurity. Nothing can be ascertained from the fact that he was a son of Viśvāmitra²,

¹ अध्यायानां शते विशे यदुक्तमसङ्ख्यया ।
 वक्ष्यामि बहुधा सम्यगुत्तरेऽर्थानिमानिति ॥
 इदानीन्तं प्रवक्ष्यामि तन्मुत्तरमुत्तमं ।
 निखिलेनीपदिश्यन्ते यत्र रोगाः पृथग्विधाः ॥
 शलाक्यशस्त्राभिहिता विदेह्याधिपकौर्त्तिताः ॥

Suśruta Saṁhitā, VI. i.

² Viśvāmitra is the *gotra* name; so the simple name may either refer to the great Viśvāmitra or to his descendants.

for the age in which the latter lived is not known to us. But he must have flourished during the Vedic Age as many Vedic Hymns are ascribed to him. In the Mahābhārata, Suśruta is mentioned as one of the sons of Viśvāmitra¹ and in the Suśruta Saṁhitā the author is often described as his son. The age of the great epic has, with good reasons, been fixed at 1000 B.C. So Suśruta must have flourished much earlier. The latest limit which we can assign to Suśruta is 600 B.C. as "there are indications in the *Śatapatha Brāhmaṇa*, a secondary Vedic work, that the author of it was acquainted with the doctrines of Suśruta" as regards the Osteology. "The exact date of that work is not known, but it is with good reason referred to the sixth century B.C." Again in the Atharva Veda, in the tenth book, there is a hymn on the creation of man in which the skeleton is described according to Ātreya and Suśruta.² "The large portion of it (Books I to XVIII) indeed admittedly belongs to a much earlier period, possibly as early as about 1000 B.C.; and the hymn in question is included in this older portion"³. This shows that Suśruta could not have flourished later than 1000 B.C.

Again in Hasti-Āyurveda, a book on the Treatment of

¹ श्यामायनीऽथ गार्ग्यश्च जाबलिसुश्रुतस्तथा—

* * * * *

विश्वामित्रात्मजाः सर्वे मुनयो ब्रह्मवादिनः ॥

Mahābhārata, Anuśāṅgana Parva, Ch. IV.

See J. R. A. S., 1906, P. 915 ; 1907, P. 1.

² Hoernle's Studies in the Medicine of Ancient India, Part I. Osteology, Introduction, P. 9.

Elephants by Pālakāpya, we find the Surgical instruments described after the manner of Suśruta. Pālakāpya lived as a Veterinary Surgeon in the Court of Romapāda, King of Aṅga, which had as its capital the famous town of Campā, identified with the modern town of Bhāgalpur. King Romapāda was contemporary with king Daśaratha, the father of Rāma, the hero of Rāmāyana.¹ Here we have a corroborative evidence of the age of Suśruta.

Suśruta is mentioned in the *Vārttikas* of Kātyāyana² who flourished during the fourth century B.C.

We have alluded to Nāgārjūna,³ the Buddhist Chemist, as the redactor of the Suśruta Saṁhitā. He is said to have been a contemporary of king Kanīṣka that is about the first century B.C.

Another revision was undertaken by Candrate, the son of Tīsaṭa, the author of Cikitsā-kalikā. He revised the text which must have fallen then into a state of corruption. The probable date of Candrate is the ninth century A.D.⁴

¹ अग्निं सुश्रुषमायस्य पितरं च यज्ञस्त्रिभम् ।

एतस्मिन्नेवकाले तु रोमपाद प्रतापवान् ।

Rāmāyana, Vālakāṇḍam, Ch. IX.

See also Rāmāyana, i, 11, 13-20 ; Mahābhārat, iii, 110, 10008-9 ; Bhāgavat, ix, 21, 7-10.

² सुश्रुतेन प्रोक्तं सौश्रुतम् ।

³ Possibly more than one Nāgārjūna appeared in ancient India as a chemist. Albérūnī says : "He lived nearly a hundred years before our time" (India, I. P. 189). Rājatarāṅgiṇī places him in the 3rd century B.C. (I. Vs. 172-173). The modern scholars are of opinion that the founder of the Mubāyāna system lived in the first century A.D.

⁴ Hoernle's Osteology, p. 100.

There is no doubt of the tradition that Suśruta's work was redacted, for the author could not write such a passage as follows : "The surgical treatises of Aupadhenava, Aurabhra, Suśruta and Pouṣkalāvata from the basis of other treatises on the subject."¹

*Commentators.*²—

1. Cakrapāṇidatta—Vānumati—1060 A.D.
2. Gayadāsa— $\left\{ \begin{array}{l} \text{Nyāya Candrikā} \\ \text{or Pañjikā} \end{array} \right\}$ —11th century A.D.
3. Jejjatācāryya.
4. Bhāskara.
5. Mādhava.
6. Bramhadeva.
7. Dallaṇācāryya—Nibandha Saṁgraha—12th century A.D.
8. Ubhalta (Kashmir).

Editions.—Suśruta Saṁhitā has been edited by Madhusūdan Gupta, Calcutta, 1835 ; by J. Vidyāsāgar, 3rd Edition, Calcutta, 1889 ; by A. C. Kaviratna, Calcutta, 1888-95 ; by Prubhurām Jibanarām, Bombay, 1901 ; and by Virasvāmī, Madras.

This book has been translated into English in part only by U. C. Datta 1883, A. Chatṭopādhyāy 1891, Hoernle 1897, Calcutta, in the Bibliotheca Indica. It has been translated into Latin by Hessler and into German by Vullurs.

The book was translated into Arabic before the end of the eighth century A.D. It is called "Kitab-Shawshoon-al-Hi .di"

¹

अपिधनवसौरभं सौयुतं पीकलावतम् ।

शेषाणां शल्यतन्त्राणां मूलाग्येतानि निर्दिशेत् ॥

Suśruta Saṁhitā, I. iv.

²

* * * * श्रीसङ्घनपालदेवदत्तपतिवङ्गभः श्रीडङ्गणः समभूत् । तेन श्रीजैज्जटं टीकाकारं श्रीगयदासभास्करौ च पञ्जिकाकारौ श्रीनाथवत्सल-देवादीन् टीपनककारांशपञ्जीव्यायुर्वेदशास्त्रं सुयुतव्याख्यानाय निबन्धसंग्रहः क्रियते ।

Dallaṇa's Commentary, I. i.

and also mentioned as "Kitab-i-Susrud" or Book Suśruta by Ibn Abillsaibial. Rhazes often quotes Sarad as an authority in Surgery.¹

VĀGBHATA I.

The next author of celebrity and whose work is still extant is Vāgbhata I or Vāgbhata the elder, the author of *Aṣṭāṅga Saṁgraha* (i.e., Compilation of the Octopartrite Science). In later times, a namesake of his, wrote another work called *Aṣṭāṅga Hṛdaya Saṁhitā* (or the best Compendium i.e., the Heart of the Octopartrite Science). In the *Uttara Sthāna*, Vāgbhata the younger distinctly states that his Compendium is based on the Compilation of Vāgbhata the elder.²

As regards the age of Vāgbhata the elder, there is the same uncertainty as with his predecessors. We are however sure that he is posterior to Caraka and Suśruta for he refers to these writers by name.³

The chronological relation of the three early authors is described in a popular couplet that Ātreya, Suśruta and Vāgbhata were the three great medical authors for the three Yugas—

¹ "His next description is from an author named Sarad, whom he frequently quotes in other parts of his works".

Adam's Commentary on Paulus Æginetta, VI. lxi.

अष्टाङ्गवेद्यकमहीदधिमन्यनेन योऽष्टाङ्गसंयहसङ्गच्छतराशिरातः ।

तन्मादनल्पफलमल्पसमुद्यमाणां प्रीतर्थमेतदुदितं प्रथगेव तन्मम् ॥

Aṣṭāṅga Hṛdaya Saṁhitā, *Uttara Sthāna*, Ch. XL, v. 82.

³ By name, e.g. in *Samgraha*, Bombay ed., Vol. I, P. 246; Vol. II, P. 421. Again quoted from Caraka, *Ibid.*, Vol. I, pp. 20, 93; Vol. II, pp. 212, 213, *et passim*; from Suśruta I, *ibid.*, Vol. I. pp. 109, 121, 177, 247; Vol. II, p. 303, *et passim*. (Hoernle).

the Tretā, Dvāpara and Kali, respectively.¹ They are known as the Vṛddha Trayī or the Old Triad. This medical tradition goes much against the conclusion of Dr. Hoernle that Vāgbhaṭa I must have flourished early in the seventh century A.D. One of the reasons put forward by him is the fact, that "the Buddhist pilgrim I'Tsing, who resided ten years in the Nalandā University (in Bihār) from about 675-686 A.D., states in *Records of Buddhist practices* that the eight arts (*i.e.*, the branches of medicine) formerly existed in eight books but lately a man epitomised them and made them on one bundle (or book)."² Professor Jolly understands by it the Suśruta Saṁhitā while Dr. Hoernle points out with more reasons that it refers to Vāgbhaṭa I's work, the Aṣṭāṅga Saṁgraha (*i.e.*, the Compilation of the Octopartrite Science) and rules out Suśruta by the word "lately."³ But the description that I'Tsing gives of the contents of the book does not warrant any reference to either. Moreover, he has not given any reason why Vāgbhaṭa II's book Aṣṭāṅga Hṛdaya Saṁhitā (the best Compendium of the Octopartrite Science) might not be alluded to by I'Tsing. Dr. Hoernle, however, rules him out by date for "he can not be placed earlier than the eighth century"—an assertion unsupported by any evidence whatsoever. All that he has proved is that "Accordingly it is probable that all these three medical writers (Mādhava, Dṛḍhaka and Vāgbhaṭa II) come in the period from the 7th to the

¹ See foot-note 3, P. 6.

² I'Tsing: *Records of the Buddhist Religion*. Transl. by Professor Takakusu, P. 128.

³ J. R. A. S., 1907, P. 413.

Hoernle's *Osteology*, Introduction, P. 10—11.

9th century A.D.¹ at no very great interval from one another," and this proof is based on the age of Vāgbhaṭa I as suggested by I'Tsing's remarks. Thus he has taken for granted what he is required to prove. He has shown that Suśruta is anterior to Vāgbhaṭa I; and Vāgbhaṭa II is posterior to him. But in trying to prove that Vāgbhaṭa I lived in the seventh century he cannot assume that Vāgbhaṭa II lived in the eighth. Another evidence adduced in support of his conclusion is the fact that the non-medical version of the list of bones of the human body as contained in the Law-book of Yājñavalkya presupposes earlier uncorrupted forms of lists of bones both in Caraka and Suśruta, and "the corrupt recension, traditionally handed down, must have come into existence at a later date," that is to say, between the date of Yājñavalkya (350 A.D.) and Vāgbhaṭa I, the latter of whom is proved to have copied from the corrupt recensions of Caraka and Suśruta. Thus the older recensions still existed in the fourth century A.D. and if we add to it the interval of time necessary for the texts to have fallen into a state of corruption, we get the early seventh century A.D. for Vāgbhaṭa I. But we must remember that there is nothing to prevent against the supposition that Vāgbhaṭa I lived before Yājñavalkya. There might have been two recensions of the texts available during Yājñavalkya's time, one corrupted and it might or might not have been the work of Vāgbhaṭa I and another true version which was availed of by the sage Yājñavalkya. And similar events have happened, as has been pointed out by Dr. Hoernle himself, in our own generation. Gaṅgādhara's recension of Caraka is a corrupted form of the text,

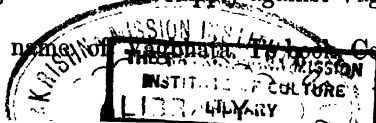
¹ *Ibid*, P. 16.

while the recension given in Jībānanda's edition is the traditional text of Caraka. No critic would I think jump into the conclusion that Gaṅgādhar lived three or four centuries after Jībānanda. Again if it be true, as he contends, that Suśruta was redacted by Vāgbhaṭa I, we could easily imagine that Yājñavalkya copied his list bones from the original Suśruta and not from the redaction of Vāgbhaṭa I. So we see that the age assigned to Vāgbhaṭa I, or the seventh century A.D. can not be accepted as proved. Dr. Hoernle says : "It should, however, be understood that these conclusions regarding the date and authorship of Vāgbhaṭa I, are not put forward as established fact."

Let us recapitulate the objections that can be urged against the conclusion that Vāgbhaṭa I lived in the seventh century A.D.

1. Vāgbhaṭa I is believed by the Indian medical men to have flourished long before the Christian era. By some, he is connected with the court of Yudhiṣṭhira, but his name is nowhere mentioned in the Mahābhārata. Ātreya, Suśruta and Vāgbhaṭa are described as the Old Triad or Vṛddhya Trayī and they were the authorities for the Tretā, Dvāpara and Kali Yugas, respectively. It is curious to observe that Dr. Hoernle in arguing against the conclusion of Prof. Jolly that Suśruta is meant by I'Tsing, takes advantage of this Indian medical tradition that Suśruta flourished during pre-historic times, but does not mention the same tradition with regard to Vāgbhaṭa I, which goes against his own conclusion. On the other hand the same objection does not apply against Vāgbhaṭa II.

2. The name of Vāgbhaṭa I is not found in the Compendium of the



Octopartrite Science, no doubt, agrees very well with the description of I'Tsing that "lately a man collected them into one bundle." But Vāgbhaṭa II's book "The best Compendium of the Octopartrite Science" is equally suggestive, though Dr. Hoernle says: "it cannot prevail by the side of the more suggestive name of the rival work of Vāgbhaṭa the elder."

3. Again in arguing against Prof. Jolly, Dr. Hoernle has attached much importance to the word "lately" by which Suśruta is ruled out by date. Admitting the validity of such reasoning, it does not follow that by the word "lately" I'Tsing meant any contemporary author or any one who preceded him by a short period only. To comprehend the meaning of the sentence we must understand the word "lately" in connection with the word "formerly" used before.¹ Now the sentence "The science of medicine formerly existed in eight books" no doubt refers to the division of Āyurveda into eight parts by Brahmā and to the treatises on the different branches of Medicine by Agniveśa, Suśruta and others. These treatises are believed to be of remote antiquity, and so any later compilation may be spoken of as recent in comparison with the old treatises of unknown ages. Thus the word "lately" may refer either to Vāgbhaṭa I or Vāgbhaṭa II, but the latter author's claim to the honour becomes reasonable considering his decided posteriority to the former and so coming within the limit of the time suggested by the word "lately."

4. Again I'Tsing refers to a book which was recognised as the standard throughout India. This may refer either to

¹ J. R. A. S. 1907. P. 174.

Vāgbhaṭa I or II. But if Vāgbhaṭa I's book occupied such a position at the time of I'Tsing, it becomes difficult to imagine why Vāgbhaṭa II should write another work principally based on the work of Vāgbhaṭa I after a lapse of a century or so. Moreover, we find at the present time, that Vāgbhaṭa II's book, *Aṣṭāṅga Hṛdaya Saṁhitā*, has a wider popularity than the book *Aṣṭāṅga Saṁgraha* of Vāgbhaṭa I. The former has been printed many times and is widely read by the students,—so much so Vāgbhaṭa is generally known as the author of *Aṣṭāṅga Hṛdaya Saṁhitā*.

5. Moreover, the Arabian physician Rhazes, who is said to have lived in the ninth century (882 A.D.) in treating of the property of ginger, the common plantain or musa and other drugs, quotes from an Indian writer, whom he calls Sindaxar or Sindicara.¹ Royle says: "But in the article *De Allio* another Indian author is quoted, whom I have not been able yet to trace out—*Ait Sindifar* (in another place written "*Dixit sindichar*") *indianus* valet contra Ventositatem." This Sindicara is identified with Vāgbhaṭa II of Sindh who was in his time known as a second Caraka or Cara, the syllable "ka" making no difference, as in words like "bāla" and "bālaka," both meaning a child.² We know that the Vāgbhaṭa's *Aṣṭāṅga Hṛdaya Saṁhitā* was one of the medical works translated by the order of Caliphs in the eighth century.³

6. The translations of the Caraka, the Suśruta and the Vāgbhaṭa occur in the Thibetan Tanjur.⁴ "George Huth,⁵

¹ Antiquity of Hindu Medicine, Page 38.

² History of Aryan Medical Science, P. 196.

³ Zeit. deut. morg. Ges. 34, p. 465.

⁴ Jour. Asiatic Soc. XXXVIII. (1835).

⁵ Zeit. deut. morg. Ges. T. (LXIX. pp. 279—284).

who has recently critically examined the contents of the Tanjur, concludes that the most recent date at which it can be placed is the 8th century A.D."¹

So I cannot avoid the conclusion that of the three authors, Suśruta, Vāgbhaṭa I and II, to which I'Tsing's remarks may refer, the last has probably the best claims to that reference; and the date assigned to Vāgbhaṭa I may well suit Vāgbhaṭa II *i.e.*, "as late as the early 7th century A.D.,"² and possibly still earlier.³ Again it is impossible for us to say whether I'Tsing's remarks may not appropriately refer to other authors whose works are lost to us.

Mention should also be made of the fact pointed out by Dr. Cordier that Vāgbhaṭa is mentioned in Rājtarāṅgiṇī and his date is fixed there as 1196-1218 A.D.⁴

But the name of Vāgbhaṭa does not occur in Stein's edition of Rāj, which is no doubt the most reliable, and so we can easily dismiss this view as untenable.

Editions.—Vāgbhaṭa I's book Aṣṭāṅga Saṁgraha has been printed in Bombay.

Commentary.—Arunadatta—about 1220 A.D.

¹ P. C. Ray's History of Hindu Chemistry, Intro., P. XXIX.

² Hoernle's Osteology, Intro., p. 10.

³ Dr. Kunte places him "at least as early as the second century before Christ," Vide his Intro. to Vāgbhaṭa's Aṣṭāṅga Hr̥daya Saṁhita.

⁴ सिद्धगुप्तसुतः परमवैज्ઞे वाग्भटाचार्यः काश्मीरनगरपति जयसिंहस्य प्रजापालन समये (खुः बादश अताब्दाम्, शक १११८—४०) वर्त्तमाना आसीत् ।

Quoted in Cordier's Vāgbhaṭa et L'Aṣṭāṅga Hr̥daya Saṁhita, 1896.

See Intro. to the Vaidyakaśabdāsindhu by Karirāja Umeścandra Gupta, 1894.

VĀGBHATA II.

The next great authority in Hindu medicine is Vāgbhaṭa II, son of Simha Gupta, an inhabitant of Sindh.¹ His work, *Aṣṭāṅga Hṛdaya Saṁhitā*, the author himself states, is based on the summary of Vāgbhaṭa the elder.² In the first chapter of *Sūtra Sthāna*, he acknowledges the help he received from the works of Agniveśa, Hārīta, Bhela, and others.³ The fact that Caraka is not referred to here as one of the sources of Vāgbhaṭa II has been taken advantage of by some to prove the posteriority of Caraka.⁴ They conclude that Agniveśa and Suśruta wrote their works long before him, and the Agniveśa Tantra was not called by the name of, and in fact was not as yet edited by, Caraka, at the

- 1 भिषग्वरी वामट इत्यमुनमे
पितामहो नामधरीऽस्मि यस्य
सुतोऽभवत्तस्य च सिंहगुप्तः
तस्याप्यहम् सिन्धुमु जातजन्मा ॥

Aṣṭāṅga.

- 2 *Aṣṭāṅga Hṛdaya Saṁhitā*, Uttara Sthāna, Ch. XL, v. 82.
See foot note 2, p. 18.

- 3 ब्रह्मा स्मृत्वाऽऽयुषी वेदं प्रजापतिमजिग्रहत् ।
सीऽत्रिवनी तौ सहस्राक्षं सीऽत्तिपुत्रादिकान्मुनीन् ॥४॥
तेऽग्निवेशादिकांस्तु पृथक् तन्त्राणि तेनिरि ।
तेभ्योऽतिविप्रकीर्णैः प्रायः सारतरीचयः ।
क्रियतेऽष्टाङ्गद्वयं नातिसंक्षेपवित्तरम् ॥५॥

Aṣṭāṅga Hṛdaya, Sūtra Sthāna, Ch. I.

4 "It would appear also that at the time Vāgbhaṭa lived, Agniveśa's work was not called by the name of Caraka, and Suśruta had also been written. Hence it follows that Caraka's edition of Agniveśa, that is the work now called Caraka, was probably edited after Suśruta had been written."

Dutt's *Materia Medica of the Hindus*, Intro., p. IX.

time Vāgbhaṭa II flourished. The argument is however not conclusive ; it only shows that the Agniveśa Tantra was available to Vāgbhaṭa II in its original form. No definite results can be expected from this *argumentum ex silentio*. Again it may easily be imagined, and I think it is the right view of the question, that Caraka lived and edited Agniveśa's work long before Vāgbhaṭa, the reason of Caraka being not mentioned in Vāgbhaṭa's book, is the fact that Caraka did not usurp the authorship of Agniveśa Tantra but clearly states at the end of each chapter the real nature of his share in the authorship of his book in the following words :—"Here ends the chapter of Agniveśa Tantra as corrected and edited by Caraka." Many modern text books of medicine have been edited and improved, though the books are still called after the original authors. Moreover to make Caraka flourish after Vāgbhaṭa II would bring him to quite modern times.

We are however arguing on false premises. Though Caraka is not mentioned in the Sūtra Sthāna of Aṣṭāṅga Hṛdaya, his name occurs in the Uttara Sthāna.¹ So there can be no doubt that Caraka's edition of Agniveśa was current in India long before Vāgbhaṭa II wrote his Aṣṭāṅga Hṛdaya Saṁhitā.

¹ यदि चरकमधीते तदधुवं सुश्रुतादि

प्रणिगदितगदानां नाममात्रेऽपि वाच्यः ।

अथ चरकविहीनः प्रक्रियायामखिन्नः

किमिह खलु करीतु व्यधितानां वराकः ॥४८॥

* * * *

ऋषिप्रणीते प्रीतिश्रेष्ठज्ञा चरकसुश्रुतौ ।

भेदाद्याः किं न पठ्यान्ते तस्माद्भ्रातृ सुभाषितम् ॥५३॥

Aṣṭāṅga Hṛdaya Saṁhitā, (Ed. Vijayratna Sen),
Uttara Sthāna, Ch. XL.

Editions.—There are various editions of the book but the following are reliable :—

1. By Dr. Anna Moreśvara Kunte, M.D., 2 vols., Bombay, 1880 ; 2nd Ed., 1891.
2. By Jibānanda Vidyāsāgara, Calcutta, 1882.
3. By Vijayratna Sen Kaviranjana, Calcutta, 1885-90.
4. By Ganeś Sastri Tartevoidya, Bombay, 1888.
5. In Sanskrit and Bengali, with the commentary of Arūṇadatta by Vijayratna Sen Gupta, Calcutta, 1886.
6. In Sanskrit and Gujrathi by Behicharlal Nathuram, Ahmedabad, 1889.
7. In Sanskrit and Bengali by Kālīśa Cundra Sen Gupta, Calcutta, 1890-1892.
8. In Sanskrit and Hindi by Pandit Robi Dutta, Bombay, 1890.
9. In Sanskrit and Marathi by Ganeś Kṛṣṇa Garde, Poona, 1891.
10. In Sanskrit and Bengali by *Kavirāja* Binod' Lāl Sen, Calcutta, 1891-1892.

*Commentaries.*¹—

1. Sarvāṅga Sundarī² by Arūṇadatta, son of Mṛgāṅka-datta, 1220 A.D.

¹ See Cordier's *Vāgbhaṭa et L'Aṣṭāṅgahrdaya Saṁhitā*, P. 6.

² इति श्रीमृगाङ्गदत्तपुत्र श्रीमदङ्गदत्तविरचितायां
सर्वाङ्गसुन्दराख्यटीकायां * * * * *

2. Āyurvedadarsayana (Dinacharyā Prakarana) by Hemadri or Kamadeva, Raja of Devagiri. It is available in parts only.
3. Aṣṭāṅgahrdayarddyota by Aśadhara Sallaxana.
4. Padārthacandrikā by Candracandana.
5. Saṅketamañjarī by Dāmodara.
6. Aṣṭāṅga Hrdayatikā by Rāmanāth Vaidya.
7. Vālaprobodhikā (Anonymous).
8. Hrdayabodhikā „
9. Pāṭhya.
10. Vāgbhaṭartha Kaumudī by Hari Kṛṣṇa Sen Mullick.
11. Pralīpa by Jaśodānandan Sarkār, 1298 B.S.

VĀGBHATA III.

The author of Rasaratna Samuccaya in the Colophons at the end of each chapter identifies himself with Vāgbhaṭa II : “Here ends Book first (or so) of R.R.S. composed by Vāgbhaṭa, son of Siṃha Gupta, prince of physician.” The salutation at the beginning of his book is strictly Buddhistic. The probable date of the book is “placed between the thirteenth and fourteenth centuries A.D.”¹ “The chemical knowledge, as revealed in Vāgbhaṭa is almost on a par with that in the Suśruta,” whereas the R. R. S. indicates an advanced state of that science. He quotes Rasārṇava as a source of his information ; he does not mention opium as a medicine, and the Firaṅga roga and its treatment find no place in his book.

¹ P. C. Rāy's History of Hindu Chemistry, Intro., p. li.

MĀDHAVAKARA.

He is the author of the famous work on Pathology or Nidāna. His book was translated into Arabic by the order of Harun-Al-Rasid and so the most recent date that can be assigned to him is the seventh century A.D.¹ Thakore Saheb of Gondal identifies him with Mādhavācāryya, the celebrated author of Sarvadarśana Saṁgraha, the brother of Sāyana, the commentator of the Vedas.² I do not find any authority for such an assertion and here is an example of fallacious reasoning based simply on the identity of names. Mādhavācāryya and Sāyana lived in the twelfth century A.D. Mention should also be made of the view expressed by Dr. Hoernle as certain that Mādhavakara, the author of Nidāna and Vṛnda Mādhava, the author of Siddhayoga are one and the same person. He holds that Vṛnda is the real name, but he was known to the commentators as Mādhava, for his melodious diction. There is no proof given of this opinion, and we have reasons for not accepting it. However as he does not treat of surgical instruments, his work is not important to us.

CAKRAPĀNIDATTA.

Cakrapānidatta or more commonly Cakradatta in a Colophon³ has given an account of himself in his book called

¹ Jolly's Indian Medicine, ff. 5, 6, pp. 7-9.

² History of Aryan Medical Science, Ch. II, p. 35.

³

गौडाधिनाथ रसवत्याधिकारिपात्र—

नारायणस्य तनयः सुनयोऽन्तरङ्गात् ।

भानीरनु प्रथितलीप्रवलीकुलीनः

श्रीचक्रपाणिनिर्ह कर्तृपदाधिकारी ॥

Colophon in Cakradatta.

Cikitsā Sāra Saṁgraha: "The author of this work is Śrī Cakrapāṇi who belongs to the family of Lodhravali; and who is the youngest brother of Vānu and the son of Nārāyaṇa, the superintendent of the kitchen of Nayapāla,¹ the king of Gour." This book is arranged on the plan of Vṛnda in his Siddhayoga² which again follows closely as a companion volume to Mādhava's Nidāna.³ The age of Cakradatta is about 1060 A.D.; and Vṛnda must have flourished between Mādhava and Cakrapāṇi for he quotes the former while he is himself quoted by the latter. So the probable age of Vṛnda is the ninth century A.D. Besides being a celebrated author, Cakradatta wrote excellent commentaries of Caraka and Suśruta. His extant works are—३६३१६

1. Cikitsā Sāra Saṁgraha or Cakradatta. A treatise on Medicine.

¹ For the date of Nayapāla, vide Cunningham's Archaeo. Survey of India. III. P. 119; also J. A. S. LX. Pt. I. P. 46. Life of Atisa by S. C. Dās.

² यः सिद्धयोगलिखिताधिकसिद्धयोगा—
नत्रैव निक्षिपति केवलमुद्धरेद्वा ।
भङ्गत्रयत्रिपथवेदविदा जनेन
दत्तः पतेत् सपदि मूर्ध्नि तस्य शापः ॥

Sloka at the end of the Cakradatta.

य इत्यादी।—सिद्धयोग इति वन्द्यतसंशयस्य संज्ञा, तल्लिखितयोगमपेक्ष्याधिका ये च सिद्धयोगा अत्र संशये सत्तात्त्विकधिकयोगान् तत्रैव सिद्धयोगे निक्षिपति, तथा यो वा तानधिकसिद्धयोगानितः संशयादुद्धरेत् दूरीकुश्यात्, तस्य मूर्ध्नि चूडशेन पुंसा दत्तः शापः पतेत्। कौटुशेन पुंसा भङ्गत्रयत्रिपथवेदविदा। कारिका वृद्धीका चन्द्रटीकेति भङ्गत्रयं, त्रिपथवेदः ऋग्यजुःसामऋषः, तदिदा ॥

Sibadāsa Sen's Commentary.

³ वन्देन * * * * * संलिख्यते गदविनिश्चयक्रमेण ॥

Vṛnda's Siddhayoga.

2. Cakradatta or Materia Medica. It treats on drugs applicable to a number of diseases.
3. Mukṭābali. This treatise on the nature and properties of medicinal drugs is ascribed to Cakrapāṇi.
4. Vānumati—Commentary on Suśruta Saṁhitā.
5. Cakratattwadīpikā—Commentary on Caraka Saṁhitā.

Editions.—

1. Cakradatta or Cikitsā Sāra Saṁgraha edited by *Kavirāja* Pyāri Mohan Sen Gupta, Calcutta, 1295 B.S.
2. Cakradatta with Bengali translation by Candrakumār Dās Kavibhūṣaṇ.
3. Cakradatta with Bengali translation and with commentary of Śiva Dās Sen, by Jaśodā Nandan Sarkār, 1302 B.S.

SĀRAṄGADHARA.

He wrote Sāraṅgadhara Saṁgraha. It is compiled from the works of Caraka, Suśruta, Vāgbhaṭa and others.¹ It is very popular in Western India. It treats on nosology and practice of Medicine. He was the son of Dāmodara and flourished in the fifteenth century A.D.

Edition.—By *Kavirāja* Pyāri Mohan Sen Gupta, Calcutta, 1296 B.S.

¹ प्रसिद्धयोगी मुनिभिः प्रयुक्ता
 चिकित्सकै र्यै बहुशीलुभूताः ।
 विधीयते शास्त्रधरेण तेषां
 सुसंयतः सञ्जनरञ्जनाय ॥

Commentary.—Śāraṅgadharaṭikā: It is a commentary on the above work by Adhamulla.

BHĀVA MIŚRA.

About 350 years ago, a compilation was made by Bhāva Miśra, son of Lataka Miśra, an inhabitant of Benares, from the most celebrated medical works and was called Bhāva Prakāśa.¹ He lived about 1550 A.D. and was considered a “Jewel of Physicians and Master of Śāstras.” He mentions China root called Tob Chini² in the Vernacular as a remedy of Firaṅga roga or Syphilis³ which he describes for the first time in India. He was the first to make mention of certain drugs of foreign countries as Badhkshani Naspasi,

- ¹ अशुर्वेदास्त्रिभ्यादतिमतिमुनयी योगरत्नानि यद्वा-
ल्लभ्या स्वे स्वे निवन्धेदधुरखिलजन व्यधिविभ्रंसनाय ।
तत्तद् यस्याद्गृहीतैः सुवचनमणिभिर्भौवमिश्रशिक्षित्वा
शास्त्रे जाड्यान्धकारं प्रशमयितुमिदं सन्विधत्ते प्रकाशम् ॥

Bhāva Prakāśa, I. i.

इति श्रीमिश्र लटकतनय श्रीमन्मिश्रभावविरचिते
भावप्रकाशे षष्ठ प्रकरणं सम्पूर्णं ॥

Colophon at the end of Section I.

- ² हीपान्तरवचा किञ्चित्किञ्चिद्वा वज्रदीप्तिवत् ।
विवन्धाधानशूलघ्नी शक्नुमूचविशोधनी ॥
वातव्याधीनपद्मारमुन्मादं तनुवेदनाम् ।
व्यपीयति विशेषेण फिरङ्गामयनाशिनी ॥

Bhāva Prakāśa, I. i.

- ³ फिरङ्गसंज्ञके देशे बाहुल्येनैव यद्भवेत् ।
तस्मात् फिरङ्ग इत्युक्ती व्याधिव्याधिविशारदैः ॥

Bhāva Prakāśa, II. iv.

Khorasani and Parasika Vacha (*Acorus Calamus*), Sulemani Kharjura (date fruit of Suleman),¹ and opium.

Editions.—

1. By Jibānanda Vidyāsāgara, Calcutta, 1875.
2. By Rasik Lāl Gupta.
3. By Kālīśa Candra Vidyārātna.

Besides these books, the number of Sanskrit medical works is simply legion ; many of them are daubed with fancy names and are excellent treatises on the different branches of medical science. But they are quite foreign to our purpose. I intend to publish in a separate volume short notices of the medical authors and their works, and so we need not dwell on them here.

- ¹ पारसीक यवानी तु यवानी सदृशी गुणः ।
विशेषात् पाचनी रुचा ग्रहिणी मादिनी गुरुः ॥

Bhāva Prakāśa, I.

पारसीकवचा युक्ता प्रीक्ता ह्रैमवतीति सा ।
ह्रैमवत्युदिता तद्वहातं हन्ति विशेषतः ॥

Ibid.

उक्तं खसफलबीरमाफूकमहिफेणकम् ।

Ibid.

चीनाक सज्जः कर्पूरः कफचयकरः स्मृतः ।

Ibid.

खज्जुरी गीसनाकारा परदीपादिहागता ॥

Ibid.

CHAPTER II.

HOSPITALS AND DISPENSARIES.

Before entering into our proper subject, it would not be amiss to notice here two objects—Hospitals and Anæsthetics—which are essentially necessary for the development of surgical knowledge. We know from the Edict II of Aśoka that India during his reign was studded with hospitals not only for the treatment of human beings but also for the brute creations. But even before Aśoka, hospitals flourished in India. In Caraka we can trace the germ of such an institution though it was used for rich men and did not accommodate the public.¹

¹ दृढं निवातं प्रवातैकदेशं सुखप्रविचारमनुपत्यकं धूमातपरजसामनभिगमनीयमनिष्टानाञ्च शब्द-स्पर्श-रस-रूप-गन्धानां सोपानीदूमलमुषलवर्चःस्थानस्नानभूमिमहानसीपितं वास्तुविद्या-कुशलः प्रशस्तं गृहमेव तावत् पूर्वंमुपकल्पयेत् ।

ततः शीलश्रीचानुरागदाढ्यप्रादक्षिण्यीपपन्नानुपचारकुशलान् सर्व्वकर्मसु पर्यवदातान् सुपीदनपाचकस्नापकसंवाहकोत्पापकसंवेशकौषधपेषकांश्च परिचारकान् सर्व्वकर्मैस्वप्रतिकुलान् । तथा गीतवादित्रीज्ञापकश्रीकगाथाव्यायिकेतिह्वास-पुराणकुशलानाभिप्राय-ज्ञाननु-मतांश्च देशकालविदः परिषद्याथ । तथा लावकपिञ्जलशशहरिणैर्नकालपुच्छकमृगमादकी-रभान् । गाञ्च दोग्ध्रीं शीलवतीमनातुरां जीवद्गत्सां सुप्रतिविद्धितदणशरस्त्रपानौयाम् । जल-पात्राचमनीदकीष्ठमणिकपिठरघटकुम्भीकुम्भकुण्डशरावदर्व्वीकपरीपचनमन्यानेलसूचकार्पासी-र्षादीनि च शयनासनादीनि चौपन्यस्तभङ्गारप्रतिग्रहाणि सुप्रयुक्तास्तरणीत्तरप्रच्छदी-पधानानि स्नापाश्रयानि संवेशनीपवेशनक्षेत्रस्त्रेदाभ्यङ्गप्रदहे परिषेकानुलेपनवमनविरचना-स्थापनानुवासन-शिरीविरचनमूर्त्तीञ्चारकर्मणासुपचारसुखानिसुप्रचालितोपधानाञ्च शल्यखर-मथ्यसा दृष्टद शस्त्राणि चोत्करणार्थानि ।

धूमनेत्रं वस्त्रनेत्रञ्चोत्तरवस्त्रिकञ्च । कुशहस्तञ्च तुलाञ्च मानभाण्डञ्च घृततैलवसामञ्जौद्र-फाणितलवणेत्थनीदक-मधुसुरासौवीरकतुषीदकमैरेयमेदकदधिमण्डेदग्निवज्राणाम्भमूचाणि च । तथा शालिषष्टिकमुद्गमाषयवतिलकुलत्यवदरमृद्धीकापरुषकाभयामलकबिभीतकानां नाना-विधानि च क्षेहस्त्रीदापकरणानि द्रव्याणि तथैवौर्द्धहरणानुलीमिकीभयभाञ्जि संग्रहनीयदीप-नीयपाक्षनीयीपशमनीयवातहाराणि समाख्यातानि चौषधानि यज्ञान्यदपि किञ्चिद्वापदः परिमंख्यायीपकरणं विद्यतं यच्च प्रतिभीगाथं तत्तदुपकल्पयेत् ॥

He advises us as follows:—The engineer is to erect a strong and spacious building, well-ventilated at one part, the other part being free from draughts. The scenery should be pleasing and one should feel happy to walk in it. It must not be behind any high building, nor exposed to the glare of the sun. It should be inaccessible to smoke and dust. There must not be anything injurious to our senses as regards sound, touch, taste, form and smell. There should be stairs, large wooden mortars and pestles; and there must be additional bare ground for the construction of a privy, bath-room and kitchen. The staff should consist of servants and companions. The servants should be good, virtuous, pure, fond, clever, generous, well trained in nursing, skillful in works, able to cook rice and curries well, competent to administer a bath, expert masseur¹, trained in raising and moving a patient, dexterous in making or cleaning beds, practiced in the art of compounding medicines and willing workers not likely to show displeasure to any order. The companions should be good singers and musicians, fluent speakers, well-versed in distichs, ballads, tales, history and mythology, well-acquainted with the design of a patient's nods or signals, agreeable and should have knowledge of the season and the locality. The various kinds of animals

¹ From the accounts of Megasthenes, we learn that four attendants used to massage him (Candragupta) with ebony rollers during the time that he was engaged in disposing of cases. Such an attendant (*saṁvāhaka*) is a minor character in the Toy Cart or little Clay Cart, drama, transl. by Ryder, in Havard Oriental Series, Vol. IX, 1905—Smith's Early History of India, 2nd Ed., Page 122. Footnote. We also find in the Kāmandikya Nitisāra that the king is cautioned against shampooers who have the opportunity of poisoning him.

सूद्व्यञ्जनकर्तारस्तत्पका व्ययकास्तथा ।

प्रसाधका भीजकाश्च गावसंवाहका अपि ॥

should always be kept in stock such as Lāva (*Perdix Chinensis*), Kapiñjala (partridge), hares, sheep and the different kinds of deers, Ena (the black antelope) blacktailed deer, and Mṛgamāṭṛka. There should be a diary attached to the building. The cow should be good natured and healthy, and should yield profuse milk. The calves must be living. There should be stocked for them potable water and hay in a clean fold. In that building must be kept the following necessary articles :—

Water vessels, washing basins, tubs, jars, dishes, ghata, (small jars) kumbhī, kumbha (larger and smaller vessels), kundu (jug or pitcher), soraba (earthen basins), spoons or ladles, cooking utensils, churning rods, cloth, thread, cotton, wool, bedding and āsana (seats). Near them should be placed drinking vessels of gold and spittoons. The bedding should consist of a broad carpet, bed-sheet, pillows, and a bedstead. There should be collected good furnitures for beds and seats ; and also utensils and appliances for application of oleaginous medicines, heat, oil, ointment, bath and perfumeries, and for the acts of emesis, purgation, draining of the brain, injection into the rectum, defaecation and urination (*i.e.* Vastīyantra, urinal, bed-pan &c.). The blunt and sharp instruments and their accessories, well-washed mullers and whetstones of different degrees of smoothness—polished, plain or rough—should be near at hand ; the tubular instruments for fumigation, inhalation and injection into the rectum, urethra and vagina, should be available there ; and the following articles are also to be stocked :—brushes and brooms, weighing scales and weights, ghee (melted butter), oil, fat, marrow, honey, molasses, salt, wood, water, spirituous liquor formed by steeping husked grains of barley in water, or by boiling together the husks of fried māṣkalāya

(pulse of Phaseolous Rox.), barley and water, spirituous liquor from the blossoms of *Lythrum Fruticose* with sugar, spirit distilled from the different sorts of grains, curdled milk, rice, gruel, whey, sour liquid produced from the acetous fermentation of powdered paddy, and the various kinds of urines of animals. Different kinds of rice such as *Śāli* (or that reaped in cold season) and *Saṣṭhika* (or that grown in hot weather in low lands and reaped within sixty days of its sowing), *Mudga* (*Phaseolus mungo*), *Māṣa* (*Phaseolus Rox.*), *Yava* (*Hordeum Vulgare*), sesame (*Seasamum Indicum*), *Kullatha* (*Dolichos Biflorus*), plums (*Zizyphus Jujube*), raisins (*Vitis - Vinifera*), *Paruṣa* (*Grewia Asiatica*), *Abhayā* (*Chebulic Myrobolan*), *Āmlakī* (*Phyllanthus Emblica*), *Vibhitaka* (*Terminalia Bellerica*) and other classes of medicaments, as oils, diaphoretics, sternutatories, cathartics, emetics, purgatives, astringents, stomachics, digestives, calmatives, carminatives and various other forms of medicines, are required for treatment. Besides these, there must be stored the antidotes to poisons caused by overdoses of medicines and other appliances likely to add to the patient's comfort.

To this may be compared the description of the Greek iatrium, which is mentioned in the Hippocratic treatise, *De Medicis*. He directs that "it should be so constructed that neither the wind nor sun might prove offensive to the patient, and goes on to enumerate the various articles which it should contain, such as scalpels, lancets, cupping-instruments, trepans, raspatories, with bandages and medicines." ¹

¹ Works of Hippocrates, Syd. Soc. Vol. II, page 470, Footnote

Suśruta gives us a list of appliances¹ required in surgical operations:—

1. Blunt Instruments. 2. Sharp Instruments. 3. Potential Caution. 4. Actual Caution. 5. Śalākā or rods. 6. Horns. 7. Leeches. 8. Hollow bottle gourd. 9. Jāmbav-ouṣṭha [a bougie of blackstone, the extremity of which is shaped like the fruit of the Jambul tree (Urginea Jāmbolana)]. 10. Cotton. 11. Pieces of cloth. 12. Thread. 13. Leaves. 14. Materials of bandaging. 15. Honey. 16. Ghee, or clarified butter. 17. Suet. 18. Milk. 19. Oils. 20. Tarpan.—flour of any perched grain or condensed milk etc. mixed with water to mitigate thirst. 21. Decoctions. 22. Liniments. 23. Plasters. 24. Fan. 25. Cold and hot water. 26. Iron pans, kalasi and other earthen vessels; beddings and seats. 27. Obedient, steady and strong servants.

The Lying-in-room.—Caraka says: "Before the ninth month of pregnancy, the lying-in-room should be constructed. The land should be cleaned of bones, gravels and potsherds. The ground selected should be of auspicious colour, taste and smell. The gate of the house should face towards the east or the north.² There must be a store of wood such as Vilva (*Ægle*

¹ अतोऽनामतं कर्म चिकीर्षता ज्ञेयेन पूर्वमेवीपकल्पयितव्यानि तद्वयथा यन्मशस्त्रद्वाराग्नि-
शलाकाभ्रकजलौकालावृजाम्बवीडपिचुर्ग्रीतसूत्रपत्रपद्ममधूघृतवसापयलेलतर्पनकषायलेपन कस्त्र-
व्यजनशीतीशीदक कटाहदीनि पारकर्म्यश्च द्विग्धाः स्थिरा बलवन्तः ।

Suśruta Samhitā. I. v.

² "The best sort of ground should abound with milky trees, full of fruits and flowers; its boundary should be of a quadrangular form, level and smooth, with a sloping declivity towards the east producing a hard sound, with a stream running from left to right, of an agreeable colour, fertile, of an uniform

Marmelos), Tinduka (*Diospyros Embryopteris*), Inguda (*Balanites* Rox.) Bhallākaka (*Semecarpus Anacardium*), Vāruṇa (*Ocimum Basilicum*), Khadira (*Acacia Catechu*) or wood of other kinds said to be auspicious by a Brāhman versed in the Atharvaveda; and there must be a sufficient provision for clothes, liniments, and covers. For the pregnant woman, be careful to have a fire-place, water, pestles and mortars, a privy, a bathing place, and ovens. These should be constructed according to the science of engineering and should be pleasant with regard to the season. There should be collected clarified butter, oil, honey, different kinds of salts as rock salt, sonchaḥ salt, and black salt, Viḍaṅgas (*Embelic Ribes*), treacle, Kuṣṭha (*Saussurea Lappa*), Kilima (*Pinus Deodara*), Nāgara (dried root of *Zinziber Officinale*), Pippali (*Piper Longum*), its root, Hastipippali (*Scindapus Officinalis*), Mandukparni (*Hydrocyle Asiatica*), Elā (*Elettarium Cardamomum*), Lāngoli (*Gloriosa Superba*), Vāca (*Acorus Calamus*), Cavya (*Piper Cava*), Chitraka (*Plumbago Zeylanicum*), Chiravilva (*Pongamia Glabra*), Hingu (*Ferrula Assafetida*), Sarṣapa (Mustard seeds), Laṣuna (*Allium Sativum*), finely or thickly powdered rice, Kādamba (*Anthocephalous Kadamba*), Ātasi (*Linum Usitatissimum*), Vallija (*Cucurbita Pepo*), Bhurya (*Betula Bhojpatra*), Kulatha (*Dolichos Uniflorus*), Mairya (a spirituous liquor from the blossoms of *Lythrum Frutecoscence*) and Āshava (Vinous fermented liquor from sugar or molasses, Rum). Also collect two pieces of

colour containing a great quantity of soil, producing water when dug to the height of a man's arm raised above his head, and situated in a climate of moderate temperature."

Manosara, Ch. I. quoted in Ram Raz's *The Architecture of the Hindus*,
Page 16.

stone (muller and stone slabs), two pestles, two mortars, an ass, a bullock, two sharp needles of gold and silver, two skeins of threads, sharp instruments of steel, two wooden bedsteads (*Ægle Marmelos*), and wood (*Tinduka* and *Ingudi*) for easily igniting fire. The female attendants should be mothers of children, and friends and relatives of the patients. They must be fond of her, skillful in work, intelligent, jolly, laborious full of tender love for the children and a favourite of the mother.”¹

The Child's Room.:—He continues—“The engincer is to construct a room, spacious, beautiful, full of light, well-ventilated but free from draughts, strong, and free from beasts of prey, animals with fangs, mice and insects. There should be kept water, mortar and separte places should be assigned for bathing, cooking, urination and defæcation. It should suit the season of the year. The beddings, seats and covers should be comfortable and suitable to the season. Auspicious ceremonies should be performed in that room such as *homa*, expiations and presents to gods, for the proper protection of the child; and there should be present pious old men, doctors, and devoted

¹ प्राक् चैवासा नवमान्मासात् सुतिकागारं कारयेदपहृतास्थिशर्कराकपालेदेशं प्रशस्त-
रूपरसगन्धार्थां भूमौ प्राग्द्वारमुदग्द्वारं वा । तत्र वैश्वानां काष्ठानां तिन्दुकैर्जुदानां भस्मात-
कानां वारुणानां खदिरानां वा यानि चानान्यपि ब्राह्मणाः शंसेयुरथर्ववेदविदसहस्रनालिप-
नाह्लादनापिधानसम्पदुपेतं तत् । वास्तु-विद्या-हृदययोगेनापिसलिलीलुखलवर्चःस्थानज्ञानभूमि-
महानसम्पत्सुखञ्च । तत्र सर्पिस्तैलमधुमैत्र्यवसौवर्चलकाललवणविङ्कजगुडकुष्ठकलिसनागर-
पिप्पलीमूलहस्तिपिप्लीमण्डूकपर्णैर्लालाङ्गलीवचाचन्यचिचकचिरवित्तव-ङ्किमुसर्षप लशुनकन-
कनिकानीपारासीवल्किजभूर्ज्वाः कुलत्थमैरियसुरासवाः सन्निहिताः स्नाः ॥ तथाऽग्नी-
हौ हे चण्डमूषले हे उलूखले खरो वृषभश्च हौ च तीक्ष्णो सूक्ष्मपिप्लवकौ सौवर्णशामतौ हे
शस्त्राणि च तीक्ष्णायसानि हौ च वित्तमयौ पर्यङ्कौ तैन्दुकैर्जुदानि काष्ठान्यग्निसमुष्णानि
स्त्रियश्च वृद्धौ बहुशःप्रजाताः सौहार्दयुक्ताः सततमनुरक्ताः प्रदक्षिणाचाराः प्रतिपत्तिकुशलाः
प्रकृतिवत्सलास्तकविषादाः क्रेशसहिष्णवीऽभिमता ब्राह्मणश्चाथर्ववेदविदो यज्ञान्यदपि तत्र
समर्थं मन्येत यश्च ब्राह्मणाः ब्रूयुः स्त्रियश्च वृद्धास्तत्कार्यम् ॥

attendants constantly. The child's bed, covers and sheets should be soft, light, pure and scented. These should always be free from sweat, dirt, worms or bugs, urine and faeces. If repeated change of new clothes be impossible, the soiled coverings should be well washed and the beddings well purified with steam and thoroughly dried before they are used again. To purify or sterilise the dress, beddings, coverings and sheets by fumigation use the following medicines with clarified butter:—Barley (*Hordeum Vulgare*), mustard seeds, linseeds, assafoetida, Guggula (*Balsanodendron Mukul*), Vāca (*Acorus Calamus*), Coraka (*Andropogon Acicularis*), Vayasthā (*Chebulic Myrobolan*), Golomi (*Panicum Dactylon*), Jaṭilā (*Nardostachys Jatamansi*), Palankaṣā (a variety of Guggula), Aśoka (*Saraca Indica*), Rohiṇī (*Picrorrhiza Kurroa*) and sankes' skin.....A variety of toys to please the child should be at hand and these should be coloured, light; musical, beautiful and must not be sharp pointed. They should be of such a size and shape as cannot be put into the child's mouth or do not terrify or kill the child."¹

¹ अतीऽनन्तरं कुमारगारविधिमनुष्याख्यास्यामः ॥ वान्तुविद्याकुशलः प्रशस्तं रथमतमस्कं निवातं प्रवातैकदेशं दृढमपगतश्वापदपशुदंष्ट्रिमुषिकपतङ्गं सुसंविभक्तसलिलोदूखलमूत्रवर्चः-स्थानस्नानभूमिमहानसस्तुमुखं यथर्तुशयनासनास्तरणसम्पन्नं कुर्यात् । तथा सुविहित-रचाविधानवलिमङ्गलहीमप्रायश्चित्तं शुचिद्वयैवानुरक्तजनसम्पूर्णमिति । कुमारगारविधिः ॥ शयनास्तरणप्रावरणानि कुमारस्य मृदुलघृष्टचिसुगन्धैर्नि रस्युः । स्वेदमलजन्तुमन्ति मूत्रपूरी-वीपमृष्टानि च वज्र्यानि रस्युः ॥ असति सन्धवेऽन्येषां तान्येव च सुप्रक्षालितपीधानानि सुधूपितानि सुशुद्धशुष्काण्युपयोगं गच्छेयुः । धूपनानि पुनर्वाससां शयनास्तरणप्रावरणानाञ्च यवसर्षपातसीहिङ्गुगुग्गुलवचाचीरकवयः स्थाग्रीलीमीजटिलापलङ्काशीकरीहिणीसर्पिर्म्मोक्तानि धृतसुम्भयुक्तानि रस्युः ॥ मणयश्च धारणीयाः कुमारस्य खड्गरुगवयवृषभानां जीवतामेव दक्षिणेश्वी विषाणेश्वीऽश्विणि गृहीतानि रस्युः । मन्वाद्याशौषधयो जीवकर्षभकौ च यावप्यन्यानि ब्राह्मणाः प्रशंसिषुः । क्रीडनकानि खल्वस्य तु विचित्राणि घोषवन्त्यभिरा-माणि अगुरुष्यतीक्ष्णाद्यानि अनास्यप्रवेशीनि अप्राणहराणि अविदासनानि रस्युः ॥

Suśruta directs that there should be a particular room provided for patients who have undergone surgical operations.¹ "Patients suffering from surgical diseases as inflammatory swelling, wounds &c. should, from the very commencement of their illness, confine themselves inside a clean house, situated in a wholesome locality, free from draughts and not exposed to the glare of the sun. For, in such a building, constitutional, mental and accidental diseases are not likely to occur. In that room, the bed for the patients should be soft, spacious, and well-arranged. The patient should lie down, his

¹ ब्रष्मिन् प्रथममेवागारमन्विच्छेत्तच्चागारं प्रशस्तवास्त्वादिकं कार्यम् ।

प्रशस्तवास्तुनिगृहं शुचावातपवर्जितम् ।

निवाते न च रोगाः सुगः शरीरागन्तुमानसाः ॥

तस्मिन् शयनमसम्बाधं स्वास्तीर्णं मनीजं प्राक्शिरस्कं सशस्त्रं कुर्वीत ।

सुखचेष्टाप्रचारः सप्तात् स्वास्तीर्णे शयने ब्रवी ।

प्राच्यां दिशि स्थिता देवास्तत्पूजार्थं नतं शिरः ॥

तस्मिन् सुहृद्भिरनुकूलैः प्रियम्बदेरुपास्थयमानो यथेष्टमासीत् ।

सुहृदो विचिपन्त्याश्च कथाभिर्ब्रूयन्वेदनाः ।

आशवासयन्तो बहुशस्तनुकुलाः प्रियम्बदाः ॥

न च दिवानिद्रावशगः सप्तात् ।

दिवास्तप्राङ्मुखे कण्डूर्गावाणां गौरवं तथा ।

अयथुर्व्वेदनारोगः स्वावयैव भृशं भवेत् ॥

उत्थानसंवेशनपरिवर्त्तनचक्रमर्णाच्चैर्भाषणादिषु चात्मचेष्टास्वप्रमत्तो ब्रह्म संरक्षेत् ।

स्थानासनं चक्रमर्णं ध्यानयानातिभाषणम् ।

ब्रह्मवान्न निषेवेत शक्तिमानपि मानवः ॥

उत्थानाद्यासनं स्थानं शय्यां चातिनिषेविता ।

प्राप्नुयान्मारुतदङ्गे रुजस्तन्मादिवर्जयेत् ॥

गम्याद्याश्च स्त्रीणां सन्दर्शनमसम्भाषणसंस्पर्शनानिदूरतः परिहरेत् ।

head pointing towards the east, and keep there some weapon for his own protection. On such a bed, the patient can lie comfortably and turn to his sides at pleasure. He should be surrounded by his dear friends, for their sweet words relieve the pain of inflammation. The female friends, however, should be avoided and kept at a distance. He should observe strictly the orders of the surgeon as regards his food, drink and mode of living. He should have his hairs clipped and nails pared short, be pure in his person, put on white clothes and devote himself to religious duties. A light should be kept burning; and garlands of flower, weapons &c., should be provided in the room to ward off the demons. He should be cheered and inspired by pleasant stories; and the physicians and the priests should attend the patient morning and evening. Pastils made of *Sinapis Nigra* and *Azadirachta Indica* with clarified butter and salt, should be burnt in the room morning and evening for ten days continually. The inflamed part should be fanned with a *cāmar* or yolk-tail. Sleep during the day, exercise and sexual intercourse must on no account be indulged in."

Suśruta also describes the kitchen of the king thus:—"That is the proper kitchen which is built on good ground, towards an auspicious quarter, full of utensils for cooking, spacious, clean, provided with windows guarded by a network, frequented by friends, cleared well of grass furnished with a canopy, purified by auspicious ceremonies, and managed by men and women of good character. The superintendent of the kitchen should, like the doctor, be noble and virtuous. The cook and servants should be pure, noble, capable, mild, good looking, engaged in their respective duties, high-minded, should have their hairs and nails cut short, steady,

well-bathed, of subdued passion, well-dressed, obedient and have their heads well-covered."

"The doctor in charge of the kitchen should be of noble family, religious, friendly, a clever manager for getting king's food properly prepared, ever careful for his health, non-avaricious, simple, fond, grateful, good-looking, cool-tempered, well-behaved, not proud and envious, laborious, of subdued passion, forgiving, pure, of good character, kind, intelligent, not easily fatigued, always loving, well wisher, capable, bold, clever, skillful, not unreasonably tender, provided with medicines and well proficient in the art of healing."¹

कुलीनं धार्मिकं क्षिप्रं सुभृतं सततोत्थितं ।
 अलम् अशठं भक्तं कृतव्रतं प्रियदर्शनं ॥
 क्रीधपारुष्यमात्सर्यं मदालस्य विवर्जितं ।
 जितेन्द्रियं क्षमावतं शुचिं शीलदयान्वितं ॥
 मेधाविनमसंयान्तमनुरक्तं हितैषिणं ।
 पटुं प्रगल्भं निपुणं दक्षं मायाविवर्जितं ॥
 पूर्वोक्तैश्च गुणैर्युक्तं नित्यं सन्निहितागदं ।
 महानसे प्रयुञ्जीत वेद्यं तद्विद्यपूजितं ॥
 प्रशस्तदिग्देशकृतं शुचिभाण्डं महच्छुचिं ।
 सजालकं गवाक्षाढ्यं सात्वतवर्गं निषेवितं ॥
 विकचसृष्टसंश्लेषं सवितानं कृतार्जनं ।
 परीक्षितं स्त्रीपुरुषं भवेत्तपि महानसं ॥
 तत्राध्यक्षं नियुञ्जीत प्राथी वेद्यगुणान्वितं ।
 शुचयो दक्षिणा दक्षाः विनीताः प्रियदर्शनाः ॥
 सविभक्ताः ममनमी नीच केशनखाः स्थिराः ।
 स्नातादृढः संयमिनः कृतोष्णीषाः सुसंयुताः ॥
 तस्याचाज्ञा विधेयासु विविधाः परिकर्म्मिणः ।
 आहारस्थित यथापि भवन्ति प्राणिनी यतः ॥
 तस्मान्महानसे वेद्यः प्रसाद रक्षितो भवेत् ।
 माहानसिक वोढारः सौपौदनिक पौषिकाः ॥
 भवेयुर्वैद्यवशगा ये चाप्यन्ये तु केचन ।
 इक्षितज्ञी मनुष्याणां वाक्चेष्टमुखवैकृतेः ॥

In the Kāmandakiya Nītisāra, we find the king advised to take thoroughly examined food, and to be surrounded by physicians well-versed in the science of Toxicology;¹ and again it is said that king should take his medicines, cordials, and edibles after having his medical attendants tasted them.² The king is advised to kill his enemy by weaning over his physician or by administering poisonous liquids.³

In the Mahāvāgga⁴ we find the qualities of a good patient and a good nurse described :—

“6. What are five qualities, O Bhikkhus, which when a sickman has, he is easy to wait upon—

When he does do what is good for him; when he does know the limit (of the quantity of the food) that is good for him; when he does take his medicine, when he does let a nurse who desires his good, know what manner of disease he has, or when he is getting worse that that is so, or when it is getting better that that is so; and when he has become able to bear bodily pains that are severe, sharp, grievous, disagreeable, unpleasant and destructive to life. These are the five qualities, O Bhikkhus, which when a sickman has, he is easy to wait upon.

¹ विषघ्नैरुदकैः स्नातः विषघ्नमनिभूषितः ।

परीक्षितं समशीयाज्जाडुस्त्राविद्विषगृहतः ॥ १० ॥

Kāmandakya Nītisāra vii. v. 10.

² औषधानि च सर्वानि पानं पानीयमेव च ।

तत्कल्पकैः समास्वाद्य प्राशीयाद्बीजनानि च ॥ २७ ॥

Ibid. vii. v. 27.

³ भिषग्भेदेन वा शत्रुं रसदानेन साध्ययेत् ॥ ७० ॥

Ibid. IX. v. 70.

⁴ Mahāvāgga viii. 26, 6 & 8 (Sacred Books of the East).

8. There are five qualities, O Bhikkhus, which, when one who waits upon the sick has, he is competent to the task—when he is capable of prescribing medicines ; when he does know what (diet) is good and what is not good for the patient, serving what is good and not serving what is not good for him ; when he does wait upon the sick out of love, and not out of greed ; when he does not revolt from removing evacuation, saliva or vomit ; when he is capable of teaching, inciting, arousing and gladdening the patient with religious discourses. These are the five qualities, O Bhikkhus, which, when one who waits upon the sick has, he is competent to the task.”

There is also good deal of evidence to show that medicines were distributed free to the poor and to the pious men. When Viṣakhā asked for eight boons of the Buddha, she mentioned amongst them the privilege of bestowing her life long “food for the sick, food for those who wait upon the sick and medicines for the sick” and explained her reasons as follows¹ :—

“9. Moreover, Lord, if a sick Bhikkhu does not obtain suitable foods, his sickness may increase upon him, or he may die. But if a Bhikkhu have taken the diet that I shall have provided for the sick neither will his sickness increase upon him, nor will he die. It was this circumstance, Lord, that I had in view in desiring to provide the Saṃgha my life long with diet for the sick.

Moreover, Lord, a Bhikkhu who is waiting upon the sick if he has to seek out food for himself, may bring in the food (to the invalid) when the sun is already far on his course, and he will lose the opportunity of taking his food. But when

¹ Mahāvāgga VIII, 15-9.

he has partaken of the food I shall have provided for those who wait upon the sick, he will bring in food to the invalid in due time and he will not lose the opportunity of taking his food. It was this circumstances, Lord, that I had in view in desiring to provide the *Samgha* my life long with food for those who wait upon the sick.

10. Moreover, Lord if a sick Bhikkhu does not obtain suitable medicines his sickness may increase upon him, or he may die. But if a Bhikkhu have taken the medicines which I shall have provided for the sick, neither will his sickness increase upon him, nor will he die. It was this circumstance, Lord, that I had in view in desiring to provide the *Samgha*, my life long with medicines for the sick."

The Edict No. II of Aśoka clearly shows that charitable institutions were common in India, during his reign. The Edict runs as follows :—

"Everywhere in the kingdom of the king Piyadasi, beloved of the gods, and also of the nations who live in the frontiers such as the Cholas, the Pandyas, the realms of Satyaputra and Keralaputra, as far as Tambapani, (and in the kingdom of) Antiochus, king of the Greeks and of the kings who are his neighbours, everywhere the king Piyadasi, beloved of the gods, has provided medicines of two sorts, medicines for men and medicines for animals. Wherever plants useful either for men or for animals were wanting they have been imported and planted. Wherever roots and fruits were wanting, they have been imported and planted. And along public roads, wells have been dug for the use of animals and men."

We also learn from Houen Tsang's account that Śīlāditya II

(610 - 650 A. D.) was inclined towards Buddhism and he forbade the slaughter of living animals, built *stupas*, and "in all the highways of the towns and villages throughout India, he erected hospices, provided with food and drink, and stationed there physicians with medicines for travellers and poor persons round about, to be given without any stint."¹

He also mentions about the father of the Bhikkhu Śrutaviṃśatikotī, that "from his house to the snowy mountains, he had established a succession of rest-houses, from which his servants continually went from one to the other. Whatever valuable medicines were wanted, they communicated the same to each other in order, and so procured them without loss of time, so rich was this family."²

He also mentions charitable institutions called *Punyaśālās* as common in India. "There were formerly in this country (Tsch-kia-Takka) many houses of charity (goodness or happiness, *Punyaśālās*) for keeping the poor and the unfortunate. They provided for them medicines and food, clothing and necessaries; so that travellers were never badly off."³

Again he says: "Benevolent kings have founded here (Mo-ti-pil-lo or Matipura) a house of "merit" (*Punyaśālās*): This foundation is endowed with funds for providing choice food and medicines to bestow in charity on widows and bereaved persons, on orphans and the destitute."⁴ A similar *Punyaśālā* or hospice was in K'ei-P'an-to (Kabandha).⁵ In describing

¹ Beal's Record, Vol. I, p. 214.

² *Ibid*, Vol. II, p. 188.

³ *Ibid*, Vol. I, p. 165.

⁴ *Ibid*, Vol. I, p. 198.

⁵ *Ibid*, Vol. II, p. 303.

Multan he says: "They have founded a house of mercy (happiness), in which they provide food, and drink, and medicines for the poor, and sick, affording succour and sustenance."¹ Of Śilāditya he says: "Every year he assembled the Sramāṇas from all countries, and on the third and seventh days he bestowed on them in charity four kinds of Alms (*viz.*—food, drink, medicine, clothing)."²

Fa Hian (405-11 A.D.), a contemporary of Candragupta Vikramāditya, describes the charitable dispensaries in the town of Pāṭāliputra thus:—"The nobles and householders of this country have founded hospitals within the city to which the poor of all countries, the destitute, cripple and the diseased may repair. They receive every kind of requisite help gratuitously. Physicians inspect their diseases, and according to their cases order them food and drink, medicines or decoctions, every thing in fact that may contribute to their ease. When cured, —they depart at their convenience."³ Smith remarks: "No such foundation was to be seen elsewhere in the world at this date; and its existence, anticipating the deeds of modern Christian charity, speaks well both for the character of the citizens who endowed it, and for the genius of the great Aśoka whose teaching still bore such wholesome fruit many centuries after his decease. The earliest hospital in Europe, the *Maison Dieu* of Paris, is said to have been opened in the 7th centuries."⁴

"Upatisso, son of Buddha Das, builds Hospitals for cripples,

¹ Beal's Record, Vol. II, p. 274.

² *Ibid.*, Vol. I, p. 214.

³ *Ibid.*, Vol. I, Intro. lci.

⁴ Smith's Early History of India, 2nd Ed., p. 280.

for pregnant women, and for the blind and diseased.¹ Dhatushena builds Hospitals for cripples and sick². Buddha Das³ himself ordained a physician for every ten villages on the high road, and built assylums for the crippled, deformed and destitute."⁴

The animal Hospitals or Piñjrāpoles which still exist at Ahmedabad, Surat, and Sodepore in Bengal, and elsewhere may be regarded as the survivals of the institutions founded by the Maurya monarch. The following account of the Surat Hospital in the 18th century is from the pen of Hamilton:—

"The most remarkable institution in Surat is the Banyan Hospital, of which we have no discription more recent than 1780. It then consisted of a large piece of ground enclosed by high walls, and sub-divided into several courts or yards for the accommodation of animals. In sickness they were attended with the greatest care, and here found a peaceful assylum for the infirmities of old age.

"When an animal broke a limb, or was otherwise disabled, his owner brought him to the Hospital, when he was received without regard to the caste or nation of his master. In 1772 this hospital contained horse, mules, oxen, sheep, goats, monkies, poultry, pigeons, and variety of birds; and also an aged tortoise, which was known to have been there seventy-five years. The most extraordinary ward was that appropriated for rats, mice, bugs, and other noxious vermins for whom suitable food was provided."⁵

¹ Mahāwanso, p. 249.

² *Ibid*, p. 245.

³ *Ibid*, p. 256.

⁴ Cunningham's Bhilsa Topes, p. 54, foot note.

⁵ Hamilton's Description of Hindustan (120) Vol. I, p. 718, quarto ed., Crooke. Things Indian, Art. Pinjrapole, (Murray 1906).

We quote here from Hemādri the opinions of the sages and the Purāṇas as to the merit of the founder of a hospital¹ :—

Visvāmitra.

There is no gift more precious than the gift of cure ; therefore it should be given freely to the sick to augment one's good fortune. He who gives medicines, diet, food, oil for smearing and shelter to the sick, becomes free from all diseases.

Samvartta.

The giver of medicines, oleaginous remedies and food for the cure of the sick, becomes free from all diseases, happy and long-lived.

Agastya.

Those who give rice and medicines freely attain happiness, being free from disease.

Saura Purāṇa.

He, who gives medicines to the sick to cure their diseases always remains healthy, long-lived and happy.

¹ अथ आरोग्यदानं ।

तच्चारोग्यदानन्ताव दुच्यते ।

आह विश्वामित्रः ।

आरोग्यदानात्परमं न दानं विद्यते क्वचित् ।

अतोदियं रुजातानामारोग्यं भाग्यवद्भवे ॥

अश्वघं पथ्यमाहारं तैलाभ्यङ्गप्रतिश्रयं ।

यः प्रयच्छति रोगिभ्यः सभवेद्भगाधिवर्जितः ॥

संवर्त्तः ।

अश्वघं स्नेह-माहारं रोगिणां रोगशान्तये ।

ददानो रोगरहितः सुखी दीर्घायुर्वे च ॥

Nandi Purāṇa.

The high-souled man who gives the Brahmins collyrium in charity to cure the diseases of the eye, goes to the Sun (after death) and becomes free from eye diseases, fine-looking and fortunate.

Good health is a step to the acquirement of religious merit, wealth, pleasure and final emancipation, and so the man who bestows cure to the sick and also he who erects a hospital equipped with good medicaments, dresses, learned doctors, servants and rooms for students, always gain them. The doctor should be well-versed in the religious treatises, experienced, familiar with the actions of medicines, a discriminator of the colour of the roots of the herbals and well-acquainted with the

अगस्त्यः ।

अघ्नौषधप्रदातारः सुखं याति निरामयाः ।

सौर पुराणे ।

रोगिणी रोगशान्तर्यमौषधं यः प्रयच्छति ।

रोगहीनः स दीर्घायुः सुखी भवति सर्वदा ॥

नन्दि पुराणे ।

अन्नं यी नरोदद्यादक्षीर्त्याधिनिवृत्तये ।

विप्राय स पुमान् याति सूर्यलीकं महानतिः ।

आरोग्यनयनी दिव्यः सुभगी जायते नरः ॥

तस्मिन्नेव पुराणे ।

धर्मार्थकाममौक्षाणां आरोग्यं साधनैर्युतः ।

अतस्त्वारोगदानेन नरो भवति सर्वदा ॥

आरोग्यशालां कुरुते महौषधपरिहृदा ।

विदग्धवैद्यसंयुक्तां मृत्यावसथसंयुतां ॥

proper season of raising them from the ground, well-trained with the qualities of the juices, (their strength and actions), sālī rice, meat and medicaments, trained in compounding medicines, one who knows well of the physique of men by intelligence, one who knows the temperament and the qualities of the diet, a pathologist who is not idle, well acquainted with the remedial agents for the premonitory signs and sequelæ of diseases, proficient in the requirements of time and place, well-read in the medical text-books—the Ayurveda with its eight divisions and an expert in curing diseases by domestic remedies (prepared from handful of common ingredients).

The pious man who erects such a hospital in which the services of good physicians of this nature are retained, becomes celebrated as the virtuous, the successful and the intelligent

वेदस्तु शास्त्रवित् प्राज्ञो दृष्टौषधपराक्रमः ।

औषधीमूलवर्णज्ञः समुद्धरणकालवित् ॥

रसवीर्यविपाकज्ञः शालिमांसौषधीगणे ।

योगविद्देहिनां देहं यो धिया प्रविशेद्बुधः ॥

धातुपथ्यमयज्ञश्च निदानविदतन्द्रितः ।

व्याधीनां पूर्वलिङ्गज्ञस्तदुत्तरविधानवित् ॥

देशकालविधानज्ञश्चित्साशास्त्रवित्तथा ।

अष्टाङ्गायुर्वेदवेत्ता मुष्टियोगविधानवित् ॥

अष्टावङ्गानि आयुर्वेदस्य ।

यथाशल्यं शालाक्यं कायचिकित्सा भूतविद्या कौमारभृत्यमगदतन्त्र रसायणतन्त्र बाजी-
करणतन्त्रमिति सुश्रुतीकृतानि ।

एवं विधः शुभो वैद्यो भवेद्यत्राभिधीजितः ।

आरोग्यशालामवन्तु कुट्यादीधर्मसंश्रयः ॥

स पुमान् धार्मिको लोके स कृतार्थः सुवृद्धिमान् ।

सम्यगारोग्यशालायामौषधैः स्नेहपाचनैः ॥

man in this world. If in such a hospital the kind-hearted man can cure a single patient of his maladies by simple medicines, oleaginous remedies and compounds of medicinal decoctions, goes to the Brahma's residence with his seven generations upwards. The rich and the poor acquire religious merit in proportion to the amount of riches they possess ; where would the poor man get a hospital and a young physician to cure his diseases ? The man secures the eternal regions mentioned before by rendering the sick healthy by the use of roots to some and by good rubbing (with external applications) to others. He who cures the sick suffering from an increase or decrease of the Air, the Bile and the Phlegm by simple remedies, he too goes to such blessed regions (after death) as are secured by those who perform many religious sacrifices (Yajñas).

व्याधिर्न विरुज्जी कृत्य अप्येकं कुरुष्यायुतः ।
 प्रयाति ब्रह्मसदनं कुलसप्तकसंयुतः ॥
 आश्चो विचानुसारेण दरिद्रः फलभाग् भवेत् ।
 दरिद्रस्य कुतः शाला आरोग्याय भिषग्गृवा ॥
 अपिमूलिन केनापि मर्दनादेरथापि वा ।
 स्वस्थीकृते भवेन्मर्त्तं पूर्वोक्तं लोकमव्ययं ॥
 वात-पित्त-कफाद्यानां चया-पचयभेदिनां ।
 यस्तु स्वस्थानुपायेन मोचयेत् व्याधिपीडितान् ॥
 सोपि याति शुभान् लोकान् अवाप्यान् यज्ञयाजिभिः ।

स्कन्दपुराणे ।

आरोग्य शालां यः कुर्यात् महाबैद्यपुरस्कृतां ।
 सर्वोपकरणीयेतां तस्य पुण्यफलं शृणु ॥
 धर्म-धर्म-काम-मीक्षाणामारोग्यं साधनं यतः ।
 तस्मादारोग्य दानेन तद्वत् स्याच्चतुष्टयं ॥
 अथैकमार्त्तं विद्वांसं स्वस्थीकृत्य प्रयत्नतः ।
 प्राप्नोति सुमहत्पुण्यमनन्तं क्षयवर्जितं ॥
 ज्ञानयोगरतं शान्तं रोगार्त्तं शिवयोगिनं ।
 यः स्वस्थं कुरुते सोपि सर्वदानफलं लभेत् ॥

Skandapurāṇa.

Hear, the amount of religious merit secured by a man who erects a hospital containing all the necessary articles (of treatment) and in which are engaged eminent physicians by reward. As good health is the means of attaining religious merit, wealth, pleasure and final emancipation, therefore, he by rendering the sick healthy, gives these four blessings.

By carefully curing a learned man of his sickness great merit is secured, which is eternal and indestructible. He too who cures a sickman who is calm and absorbed in meditation of Siva and knowledge, attains the virtue of all kinds of gifts. Bramhā, Viṣṇu, all the gods, diseases, relatives and kings—they are obstacles to yoga but not to those who perform it (yogi). Whatever merit is obtained by the great, by supporting the sick Brāhmans (priests), Kshatriyas (warriors), and Biṭh (cultivators) and Sudras (servants), can not be obtained by the performance of all the great Yajñas (religious ceremonies). As even the gods can not reach the end of the

ब्रह्मा विश्वः सुराः सर्वे व्याधयः स्वजना नृपाः ।

योगस्यैते महाविघ्ना व्याधयस्ते न योगिनां * ॥

ब्रह्म-क्षत्रिय-विट्-शूद्रान् रोगार्त्तान् परिपाल्य च ।

यत्पुण्यं महादाप्नोति न तत्सर्वमहामखैः ॥

आकाशस्य यथा नान्तः सुरैरप्युपलभ्यते ।

तद्वदारीयदानस्य नान्तोवै विद्यते क्वचित् ॥

पुण्येनानेन महता गत्वा शिवपुरं नरः ।

मीदते विविधेर्भोगैर्विमानैः सर्वैकामिक्तैः ।

एकविंशत्कुलीपेतः सभृत्यः परिपालितः ।

आस्ते शिवपुरे नावदावदाङ्गतसम्भवं ॥

ततः स्वधर्मशेषेण संप्राप्तः प्रयतः सदा ।

ज्ञानमुत्पद्यते तस्य रुद्रेभ्यः परिचारकः ॥

* स्वेन योगिनामिति वा पाठः ।

firmament, so there is no end (to the merit) of the gift of cure. By this great merit, the man reaching the region of Siva enjoys himself by soaring in a balloon which can go to the various desired directions. With his twenty-one generations upwards and surrounded by his servants, he stays in the Siva's realm so long till deluge does not occur. There, after the lapse of his merit, the devoted servant acquires knowledge from Siva.

Abandoning this world by knowledge, abiding by the prayers to Siva, and casting away this body as a straw, he reaches beyond the limits of sorrow. Being freed from all sorrows, becoming pure, all-knowing and self-sufficient, and absorbed in his ownself, they are called the Liberated. Therefore to mitigate the diseases, the sick should be well nursed; the great sages should especially be attended to even by the sacrifice of one's body or riches. The wise must not irritate the weak patients, and they like the preceptors should be rescued constantly from sins. He who relieves the sick, by taking them under his care, reaches the other bank of this ocean of world.

ज्ञानाविरक्तः संसाराच्छिवध्यानमुपाश्रितः ।
 सदेहं तणवत्प्रकृता सर्वदुःखान्माप्नुयात् ॥
 समस्तदुःखनिर्मुक्तः शुद्धः स्वात्मव्यवस्थितः ।
 सर्वज्ञः परिपूर्णश्च मुक्त इत्यभिधीयते ॥
 तस्माद्दीपावर्गार्थं रीगार्त्तं समुपाचरेत् ।
 विशेषेण तु योगीन्द्रं शरीरेण धनेन च ॥
 रीगिणीं नीडिजत् प्राज्ञी दुर्खलानपि सर्वदा ।
 तान् पापाद्गुणवन्नित्यमेवन्मर्त्यः प्रवर्त्तते ॥
 योग्यस्त्रीतमात्मानं मन्यमानो दिने दिने ।
 उपसर्पेत रीगार्त्तंस्त्रीर्षस्तेन भवार्थवः ॥

इत्यारोग्यदानं ।

Hemādri's Cāturvarga, Cintāmoni, Dāna Khāṇḍam,
 Asiatic Soc. Ed. Ch. XIII. P. 891—95.

After these proofs, the statement of Mr. Ameer Ali that "the Arabs invented chemical pharmacy, and were the founders of those institutions which are now called dispensaries"¹ can not be accepted as correct.

DISPENSARIES.

As regards dispensaries, Suśruta advises the physician to construct his dispensary in a clean locality; and the building should face towards some auspicious direction as the east or the north. He says:—"The medicines should be kept in burnt earthen pots arranged on planks supported by stakes or pins".² This is still the method of storing medicines used by the *Kavirājas*. Dallvaṇa explains the passage thus:—"The medicines should be kept in pieces of cloth, earthen pots, wooden pots and Śaṅku (kilaka)."³ The former explanation is plausible for it is impossible to imagine how a kilaka or stake can be a container of medicine, unless it is implied as a point of support for hanging the medicine vials from it.

Dr. Heyne (1814) thus describes the ancient dispensaries of the Hindus: "The place in which medicines are kept should

¹ History of the Saracens p. 262, 1899.

² प्रीतश्चन्द्राण्डफलकशङ्खुविन्यस्तमेषजं
प्रशस्तायां दिशि शुचौ मेषजागारमिष्यते ॥

Suśruta Saṁhitā. I. xxxvii.

³ गृहीतौषधसंस्थापनोपायं दर्शयन्नाह:—प्रीतेति । प्रीतः कर्पटखण्डं, मृदा भाण्डं, मृत्भाण्डं । फलकं पट्टकं इति पुस्तकान्तरे पाठः, शङ्खुः कौलकः, एतेषु प्रीतादिषु विन्यस्तं धृतं मेषजं यस्मिन् गृहे तत् मेषजागारं मेषजगृहमिष्यते इति सम्बन्धः । प्रशस्तायां दिशि पूर्वस्यामुत्तरस्यां वा, शुचौ देशे अस्मिन् भूमिप्रविभागीयाध्याये, निवन्धेषु व्यत्ययेन न पाठी दृश्यते । अस्माभिस्तु वृद्धक्रमरीत्यैव पाठी लिखित इति सर्वावयवसाध्येष्वित्यादि यावन्नवं द्रव्यं पुराणश्चेति पाठं केचिदाचार्या न पठन्ति ॥

be clean, dry, and not accessible to rats, white ants or dust. The drugs ought to be put in nets, or large pots, the mouth of which must be tied over with a piece of cloth, and suspended in a room. Fire, smoke and water must be kept at a distance.

The house in which medicines are stored, should be neither in too high nor too low a situation, and it should not be far distant from places in which medicines may be collected. Its front should face either the south or the north, with a convenient *viranda* before the door of the same side.

The necessary apparatus for mortars, scales, &c., must be kept in a place in the wall that has been consecrated for that purpose by religious ceremonies."

After describing the different classes, and members composing each class, of medicines, Suśruta continues: "The wise physician should collect and classify these medicines, and with them prepare external applications, infusions, oils, ghee, syrups, &c., as required for derangement of a particular humour. The medicines should be carefully preserved in all seasons, in rooms free from smoke, rain, wind and dust. The medicines should be used singly, or in combinations of several medicines of a class, or of an entire group, or of more than one group, according to the nature of the disease, and the extent of derangement of the humours."¹

¹ एभिर्लेपान् कषयांश्च तैलं सर्पीषिपानकान् ।
प्रविभज्य यथान्यायं कुर्वीत मतिमान् भिषक् ॥
धूमवर्षानिलक्लेदैः सर्वैर्गुणभिरुते ।
वाहयित्वा गृहे न्यस्येद्विचिनीषधसंयुतं ॥
समीक्ष्य दोषभेदांश्च गणान् भिन्नान् प्रयोजयेत् ।
पृथक्पिशाण् समस्तान् वा गणं वा व्यस्तसंहतं ॥

ANÆSTHETICS.

In the medical text books of the Hindus, there is no mention of a general anæsthetic, from which we can infer that it was unknown in those ancient days. There are, however, many indications to show that the earlier surgeons felt the necessity of such an agent to produce insensibility to pain. Both Caraka and Suśruta mention the use of wine to produce the desired effect. Caraka says: "After extraction of a dead fœtus before the full term of pregnancy, wine should be prescribed to her, for that will improve the condition of her uterus, make her happy and alleviate the pain of the operation."¹ Suśruta, however, distinctly lays down that "wine should be used before operation to produce insensibility to pain." He again remarks: "It is desirable that the patient should be fed before being operated on. Those who are addicted to drink and those who cannot bear pain, should be made to drink some strong beverage. The patient, who has been fed, does not faint, and he who is rendered intoxicated, does not feel the pain of the operation."²

The use of certain drugs to produce anæsthetic effects was well known to the ancient Greeks and Romans. Dioscorides

¹ व्यपगतगर्भशल्यान्तु स्त्रियसामगर्भां सुराशीध्वनरिष्टमधुमदिरासवानामन्यतममग्रे सामध्येतः पाययेत् गर्भकीडविशुद्धार्थमर्त्तिविस्मरणार्थं प्रद्वेषस्वार्थं ॥

Caraka Samhitā, IV, viii.

² प्राक्शस्त्रकर्षणश्रेष्ठं भोजयेदातुरं भिषक् ।
मदापं पाययेन्मद्यं तीक्ष्णं योऽवेदनासहः ॥
न मूर्च्छत्यन्नसंयोगान्मत्तः शस्त्रं न बुध्यते ।
तस्मादवश्यं भोक्तव्यं रोगिषूत्तेषु कर्मेणि ॥
प्राणी क्षाम्यन्तरी नृणां वाह्यप्राणगुणान्वितः ।
धारयत्यविरोधेन शरीरं पाञ्चभौतिकं ॥

Suśruta Samhitā, I, xvii."

mentions Mandragora (*Mandragora Atropa*) to have been employed internally as a hypnotic and anæsthetic. Pliny (32-79 A.D.) in his *Natural History* mentions that this anæsthetic was also used by inhalation; and this fact is corroborated by Galen, Aræteus, Celsus and others. The Arabian physicians also used it. The Chinese surgeons still use some powder (Indian hemp probably) to throw their patients into profound sleep. In the 13th century Theodoric (died 1298) described the "spongio somnifera" the vapours raised from which were capable, when inhaled, of setting patients into an anæsthetic sleep, thus inducing insensibility to the agony and torture of a surgeon's knife. Baptista also mentions his "*Pomum somniferum*", to be made with mandragora, opium, &c. The Hindus also inhaled the fumes of burning Indian hemp as an anæsthetic at a period of great antiquity. As early as 927, A. D., they also knew drugs which they employed for the same purpose, for Paṇḍit Vallāla, in his *Bhoja Prabandha*, alludes to a cranial operation performed on the King Bhoja after he was rendered insensible by some drug called *Sambohini* (producer of unconsciousness). Another drug is also mentioned, *Sanjibani* (restorer to life), by which he soon regained consciousness after the operation had been finished.¹

¹ ततस्तत्रापि राजानं मोहचूर्णेन मोहयित्वा शिरःकपालमादाय तत्करोटिकापुटे स्थितं शफरकुलं गृह्णीत्वा कस्मिंश्चिद्भाजनं निक्षिप्य सन्धानकरणया कपालं यथावदारचय्य सञ्जीवनाच्च तं जीवयित्वा तस्मै तद्दर्शयताम् ।

Bhoja Prabandha (*Jibānanda's* Edn.), P. 98.

CHAPTER III.

MATERIALS OF INSTRUMENTS.

IRON AND STEEL.

In the R̥gveda, *ayas*, (Latin *aes*), next to gold, is the metal most often referred to. *Ayas* often stands as a generic name to mean simply "metal," though in later works it signifies iron as a rule. The mention of dark and red *ayas* in the Atharva-veda indicates a distinction between iron and copper or bronze. The surgical instruments of the Hindus are recommended generally to be made of iron; but Suśruta allows other suitable material when iron of good quality is not available.¹ He says: "A wise surgeon should get the instruments made of pure iron and with sharp edges by an expert blacksmith who is skilful and experienced in his craft."² The use of impure iron as a material for surgical instruments, he deprecates as a defect and advises the surgeons not to rely on such instruments.

The Hindus were acquainted with steel and they knew how to turn out steel of fine quality from a pure iron ore. Nāgārjuna, the well known Buddhist chemist, wrote a scientific

¹ तानि प्रायशी लौहानि भवन्ति तत्प्रतिरूपकाणि वा तदलाभे ।

Suśruta Saṁhitā. I. vii.

² अस्त्राण्येतानि मतिमान् शुद्धशैल्यायसानि तु ।

कारयेत् करणैः प्राप्तं कर्षारं कर्षकीविदं ॥

Ibid, I. viii,

treatise on steel and iron.¹ Śibodāsa in his commentary on Chakrapāṇi quotes Patañjali as an authority on the subject.² In the Dhanurveda, Viracintāmaṇi, Śāraṅgadharapaddhati and Lohārṇava, steel as a material of sword has been described and classified.

Dr. Mitra quotes some references³ about the knowledge of iron possessed by the ancient Hindus from the R̥gveda. He finds that "swords (II. 156), spears (IV. 25), javelins (II. 292), lances (I. 774), (IV. II. 288) and hatchets (I. 120) are frequently mentioned; and these weapons were bright as "gold" or golden (IV. 19), "shining bright" (I. 175), "blazing" (IV. 93), "sharp" (IV. 113) and "made of iron" (I. 226); they are "whetted on a grind stone" (II. 36) to improve their keenness (I. 150), and "polished to enhance their brightness" (II. 326)....."According to Nearchus, King Porus gave 30 lbs of steel to Alexander as the most precious present he could offer."

Royle also remarks⁴: "Working in metals they have long been famous for: their steel acquired so great celebrity at an

¹ नागार्जुनी मुनीन्द्र शशास यज्ञोद्देशस्तमतिगहनम् ।

तस्यार्थस्य श्रुतये वयमेतद्विशदाचरैर्ब्रूमः ॥

Cakradatta, Rasāyanādihikāra.

² अर्चयित्वा विधानेन हरिम् गुह्यमास्तरौ ।

लोकपालान् यज्ञाश्वे च त्रपालानथौषधम् ।

आदित्यदेवताग्नेह धन्वन्तरौ-पतञ्जली

दद्यादलिञ्च सर्व्वेभ्यो नानामचीपचारतः ॥

Quoted in Śibodas's commentary on Louhamārāṇa.

Vidhi in Cakradatta.

³ Dr. R. L. Mitra's Indo-Aryans, Vol. 1, P. 301. See Wilson's R̥gveda.

⁴ Royle's Antiquity of Hindoo Medicine, Pp. 46-7.

early period, as to have passed into a proverb among the Persians, where *fouladee hind* indicates steel of the best quality; and *jurabee hind*, an Indian answer, means a cut with a sword made of Indian steel."

COPPER.

Pure copper was also used as a material of instruments; and vessels and instruments of copper are frequently mentioned in the medical books of the Hindus. A copper probe for applying antimony to the eye has been found in the excavations of Bijnor and another in the Bihat excavations. Cakradatta¹ advises us to use a copper probe for the application of *lekhana* collyrium; and suśruta mentions a copper needle in the operation for reclination of cataract.²

TIN.

Tin was also used as a material of blunt instruments. Suśruta mentions plates of tin to surround a tumour and to protect the healthy parts, before the application of actual cautery.³ Such plates are recommended to be made of tin, or lead, or copper, or iron.

LEAD.

Tubes of lead were used for purpose of fumigation. Probes made of lead were used for application of collyrium. The use

¹ प्रशस्ता लेखने ताची रीपने कालबीहजा ।

Cakradatta, Afījanadhikāra.

² ताम्बायसी शतकीन्मी शलाका स्यादनिन्दिता ।

Suśruta Samhitā, VI. xvii.

³ अल्पावशिष्टे कृमिभिः कृते च लिखिततोऽग्निं विदधीत पश्चात् ।

यदल्पमूलं तपुतामसीस पट्टेः समावेध्य तदायसेर्वा ।

चाराग्निशलाख्यं सकृद्विदध्यात् प्राणाणहंसनं भिषगप्रसक्तः ॥

Suśruta Samhitā, IV. xviii.

of lead plates to surround tumours before application of actual cautery has been noted above.

BELL-METAL.

The use of bell-metal—an amalgam of zinc or tin and copper, 25 parts of the former with 75 parts of the latter,—as a material of probes for applying collyrium, is mentioned by Suśruta.¹

GOLD AND SILVER.

Gold was known to the Hindus from the remote antiquity; and among the metals, it is the one most frequently² mentioned in the R̥gveda. Silver was perhaps unknown during the earlier Vedic age, from its name being not mentioned in the R̥gveda. But no conclusion can safely be drawn from this argument³. We find, however, gold, silver, and other precious

¹ सौवर्णं राजतं शङ्खं ताम्रं वदूयकांसाञ्जं
आयसानि च योज्यानि शलाकाश्च यथाक्रमं ॥

Suśruta Saṁhitā, VI. xviii.

² “निष्क यीव”

R̥gveda. 5 Mandala. 19 Sūkta.

“निष्केन सुवर्णेन अलङ्कृता यीवा” ।

Sāyana.

अश्वः न हेम्यावान् ।

Ibid. 4 Mandala. 2 Sūkta.

“सुवर्णं निश्चितं कृत्यावान् अश्वः” ।

Sāyana.

“A horse with golden caparisons”—Wilson.

³ “एनौ रयि” ।

R̥gveda. 5 Mandala. 33 Sūkta.

एनवर्णा श्वेतवर्णा रयिं धनं ।

Sāyana.

“Query, if silver money be intended”—Wilson.

stones mentioned as materials of instruments in the medical books. Gold and silver vessels and plates are often described in Sanskrit literature.¹ Suśruta mentions the use of drinking cups made of gold, silver and precious stones.²

Caraka, amongst other things necessary for a lying-in-room, mentions two needles of gold and silver.³ To cut the navel-cord of the new-born child, he recommends a knife made of gold, or silver, or iron.⁴ In the Manusamhitā⁵ we find: "Before the section of the navel string, a ceremony is ordained on the birth of a male; he must be made while sacred texts are pronounced, to taste a little honey and clarified butter from a golden spoon."⁶ A golden needle is mentioned by

- ¹ सुवर्णरूप्यशङ्खाश्च युक्ति रत्न मयानि च ।
कांस्थाय स्नाम्न रैत्यानि एपुसीस मयानि च ।
निलोपानि विद्युद्भ्रान्ति केवलेन जलेन तु ॥

इति ब्राह्मे ।

- ² सौवर्णे राजते ताम्रे कांसेऽपि मणिमये तथा
पुष्पावतंसं भौमे वा सुगन्धि सलिलं पिबेत् ॥

Suśruta Samhitā, I. xlv.

- ³ * * * तीक्ष्णौ सूचीपिचलकौ सौवर्णं राजतौ द्वे शस्त्राणि च तीक्ष्णायसानि ।

Caraka Samhitā, IV. viii.

- ⁴ नाभिवन्धनात् प्रभृति द्विवाष्टाङ्गुलमभिज्ञानं कृत्वा क्खेदनावकाशस्य हृथीवत्करथीः
शनेष्टं ह्येत्वा तीक्ष्णेन रौक्मराजसायसानां क्खेदनानामन्यतमेनीर्द्धशरिण क्खेदयेत् ॥

Ibid.

- ⁵ ग्राड् नाभिवर्धनात्पुंसो जातकर्म्म विधीयते ।
मन्त्रवत्प्राशनं चास्य हिरण्यमधुसर्पिषाम् ॥

Manusamhitā, II. 29.

- ⁶ Manusamhitā (ch. II. V. 29. Jones's trans.)

Suśruta for pricking the bulb of Soma plant to extract its juice.¹ To cure trichiasis, Cackradatta mentions a needle cautery of gold.² For destroying the hair follicles, he advises us to pass the hot needle into them as soon as the eyelashes are removed by epilation. In the Yogaratnākara, is mentioned a cautery of gold, to burn the fistulous track round the anus.³ Śārṅgadharma mentions silver or coral pots for keeping medicated snuffs,⁴ and gold and silver tubs for immersing patients in medicated lotions.⁵

HORN.

Horns of animals are mentioned as suction-apparatus. For

¹ * * * * सोमकन्दं सुवर्णसूच्यादिविदार्य पयोऽग्नौयात् सौवर्णे
पावेऽञ्जलिमाव' * * * *

Suśruta Samhitā, IV. xxix.

² प्रवृत्तान्मूर्ख' रोम सहिष्णीरुद्धरक्कनैः ।
सन्दर्शनीद्वरेद्व्यां पक्षरोमाणि वृद्धिमान् ।
रक्त्रचि दहेत् पक्ष तप्तहेमशलाकया ।
पक्षरोगे पुनर्नैव' कदाचिद्रोमसम्भवः ॥

Cakradatta, Netraroga Cikitsā.

³ अपानमार्गपिटिकां दहेत् स्वर्णशलाकया ।
अग्निप्रतप्तया पथात् कुप्यादग्निव्रणक्रियाम् ॥

Yogaratanākara, p. 347.
(Anandāsram Series).

⁴ कोष्णमच्छिन्नधारं हेमतारादिशक्तिभिः ।
शुक्त्या वा पात्रे युक्त्या वा प्लातेष्व्वा नस्यमाचरेत् ॥

Śārṅgadharma Saṁgraha, III. viii.

⁵ सौवर्णे राजतं वापि ताम्रमायसञ्चदारुजं ।
काष्ठकं तत्र कुञ्जीतीक्ष्णाय षट्त्रिंशदङ्गुलं ॥

Ibid, III. ii.

this purpose, the horn of a cow is recommended.¹ A probe made of horn is advised to be used for applying collyrium. Suśruta mentions goat's horn to be used as a container of medicine.² He also recommends for this purpose vessels manufactured out of horn.³ Similarly Caraka advises us to keep medicines in the lamb's horn.⁴ Tubes of Vasti-yantra (clysters) are often described to be made of horn.⁵

BONE AND IVORY.

Vāgbhaṭa II describes the aṅguli-trāṇaka or finger-guard to be made either of wood or ivory.⁶

¹ “चूषणे”, विष पूयाद्या चूषण निमित्तं शरीरेषु युज्यते यत्, “शृङ्ग” गवादि भवं शुषिरं शृङ्ग * * * *

Vāgbhaṭārtha Kaumudī, I. xxv.

² चूर्णाञ्जनं कारयित्वा भाजने मेषशृङ्गजे ॥
संस्थाप्योभयतः कालमञ्जयेत् सततं बुधः ।

Suśruta Saṁhitā, VI. xv.

वंशे वा माहिषे शृङ्गे स्थापयेत् शोधितं रसम् ।

Rasendra Cintāmaṇi. IX.

³ एतन्नूर्णाञ्जनं श्रेष्ठं निहितं भाजने शुभे ।
दन्तस्फटिकवैदूर्यं शङ्खशैलासनोद्भवे ।
शतकुम्भेऽथ शङ्खं वा राजते वा सुसंस्कृते ॥

Suśruta Saṁhitā, VI. xix.

⁴ सिद्धः शैलासने भाण्डे मेषशृङ्गे च संस्थितः ॥

Caraka Saṁhitā, VI. xxvi.

⁵ विमुद्रासं त्रिखण्डाच्च धातुजां काष्ठजां तथा ।
षडङ्गुलीस्यां गोपुच्छां नाडीं युञ्ज्यात् द्विहस्तिकां ॥

Sārāṅgadhara Saṁgraha, III. ii.

⁶ अङ्गुलि वाणकं दान्तं वाचं वा चतुराङ्गुलं ।

Aṣṭāṅga Hṛdaya. I. XXV.

WOOD.

To apply vapour-bath, Śārṅgadhara mentions tubes made of wood or metal.¹ Wooden Tubes for injections were also used.²

STONE.

Śārṅgadhara says: "The collyrium probes should be made either of stone or metal".³ For compounding medicines, stone *khul* or mortar and pestles are mentioned. A big stone slab with a muller is recommended to be used for grinding dry or fresh vegetable medicines. In extracting the Soma juice, two slabs of stone are mentioned in the Rgveda.⁴

EXECUTION.

The execution of the instruments is said to have been all that can be desired. Suśruta says⁵: "They should be made just of the proper size with their ends rough or polished; they should be also strong, well-shaped and capable of a firm grasp." Again he continues: "When an instrument (has been selected) of

¹ नेत्रानि धातुजान्याहुर्नल वंशादिजान्यपि ॥

Śārṅgadhara Saṁgraha, III. ix,

² नेत्रं कार्यं सुवर्णादिधातुभिश्चवेणुभिः ।
मलेर्दृष्ट्वैविषाणायैः मणिभिर्या विधीयते ॥

Ibid, III. v.

³ सुखयोः कुञ्जिता यच्चा शलाकाष्ठाङ्गुलीन्मिता ।
अश्मजा धातुजा वा स्यात् कलायपरिमण्डला ॥

Ibid, III. xiii.

⁴ Rgveda. 10 Mandala, 76, 94 & 175 Sūktas.

⁵ समाहितानि यन्त्राणि खरश्लक्ष्मसुखानि च ।
सुदृढानि सुरूपाणि सुयद्वाणि च कारयेत् ॥

Suśruta Saṁhitā, I. vii,

a fine make and with an edge keen enough to divide the hairs on the skin, and when it has been firmly grasped at the proper place, only then it should be used in any surgical operation"¹. And again: "A wise surgeon will get his instruments made of good iron and with sharp edges, by a blacksmith who is skilful and experienced in his craft."² Vāgbhaṭa also gives the same directions.³

ORNAMENTATION.

In the absence of actual specimen, it is impossible to say whether there was any ornamentation on the surgical instruments of the Hindus. No ornamentation is described in the extant medical treatises. Only one instrument—Mucutī—is mentioned by Vāgbhaṭa II as being ornamented with a ring.⁴

EDGES OF SHARP INSTRUMENTS.

Suśruta says⁵: "The edges of instruments, used in incising

- ¹ यदा सुनिश्चितं शस्त्रं रोमच्छेदि सुसंस्थितं ।
सुगृहीतं प्रमाणेन तदा कर्मसु योजयेत् ॥

Ibid, I. viii.

- ² See foot-note 2, P. 61.

- ³ षड्विंशतिः सुकर्मारैर्घटितानि यथाविधि ।
शस्त्राणि रोमवाहीनि बाहुल्येनाङ्गुलानि षट् ॥
सुरूपानि सुधाराणि सुग्राहि च कारयेत् ।
अकरालानि सुभ्रातसुतीक्ष्णावार्ततेऽयसि ॥
समाहितसुखायाणि नीलाश्वोज्ज्वलीनि च ।
नामानुगतरूपाणि सदा सन्निहितानि च ॥

Aṣṭāṅga Hr̥daya, I. xxv.

- ⁴ मुचुटी सूक्ष्म दन्तर्जुर्मूले रुचकभूषणा ।

Ibid.

- ⁵ तच्चधारा भेदनानां मासूरी । लेखनानामङ्गमासूरी ।
व्यधनानां विस्त्रावणानाञ्च कैशिकी । छेदनानामङ्गकैशिकीति ॥

Suśruta Saṁhitā, I. viii.

(as of Vṛddhipatra, Nakhaśastra, &c.) should be of the fineness of a masūra (Ervum Lens); of those used in scarifying (as Maṇḍalāgra &c.) of a half a masūra; of those used in puncturing (as Kuṭhārikā) and evacuating (as needles, kuśapatra, &c.) of a hair; and those used in dividing (as Vṛddhipatra), of half a hair". As to the Vālīśa or hook and the Dantaśaṅku or tooth-scalers, the former should have a curved end and a fine point, while the latter should have an end shaped like the first leaf of barley."¹

THE TEMPERING OF SHARP INSTRUMENTS.

Suśruta remarks² that "the instruments are tempered in three ways;—by immersing the heated *śastra* in an alkaline solution, or water, or oil. Those tempered in an alkaline solution are used in dividing bones and in excising arrows and other foreign bodies. Those tempered in water are used in incising, dividing or clearing muscles; and those tempered in oil are used in puncturing veins and dividing nerves and tendons."

As the methods of tempering the śastras are the same as those recommended for the arms of war, we quote from Vṛddha Śāringadhara (the elder), two methods of tempering arrow-heads and swords. He says³: "I shall describe the ways of tempering arrow-heads, by smearing them with a paste of

¹ वङ्गिशा दन्तशङ्कुयानताये तौल्यकण्टकप्रथमं यवपत्रमुखे ।

Suśruta Saṁhitā, I. viii.

² तेषां पायना त्रिविधा चारीदकतैलेषु तत्र चारपायितं शरशलास्थिच्छेदनेषु ।
उदकपायितम् मांसच्छेदनभेदनपाटनेषु तैलपायितं सिराव्यधनस्नायुच्छेदनेषु ।

³ फलस्य पाचनं वल्ये वनौषधिर्विलिपनेः ।

Ibid.

येन दुर्भेद्यवर्माणि भेदयेत् तरुपर्णवत् ॥

Vṛddhya Śāringadhara,

vegetable drugs, which would thus acquire the power of piercing a coat-of-mail as easily as the leaf of a tree."

I.

"Make a paste of Pippalī (Piper Longum), rock-salt and Kuṣṭha (Saussurea Lappa) with cow's urine. These are to be well mixed until the paste becomes cold and yellow. The arrow-heads and other sharp cutting instruments are to be well smeared with that paste and then heated to redness. Then they are to be removed from the furnace and allowed to cool down to a state short of redness and dipped in oil. By this means, the iron acquires special power as a cutting instrument¹".

II.

"Make a paste of the five kinds of salts,² mustard and honey. Let the instrument-maker smear it on the śastras which are then to be heated in a furnace. When the colours resembling those of a peacock's feather are displayed on the śastra, the burning is known to be adequate. The instrument is then dipped in water³".

¹ पिप्पली सैत्थवं कुष्ठं गोमूत्रेण तु पेययेत् ।

अतिशीतं मनाविद्धं पीतं नष्टं तथौषधम् ॥

अनेन लेपयेच्छस्त्रं लिप्तं चाग्नौ प्रतापयेत् ।

ततो निर्व्वापितं तैले लौहं तत्र विशिष्यते ॥

Vṛddhya Śārṅgadharma.

² सौवर्चलं सैत्थवच्च विङ्गमौद्गिदमेव च ।

सामुद्रेण सहैतानि पञ्चसुलवणानि च ॥

Vaidyaka.

³ पञ्चभिर्लवणेः पिष्टं मधुसिक्तः ससर्षपैः ।

एभिः प्रलेपयेच्छस्त्रं लिप्तं चाग्नौ प्रतापयेत् ॥

श्लिखिशोबानुवर्णाभं तप्तपीतं तथौषधं ।

ततस्तु विमलं तीर्थं पाययेच्छस्त्रमुत्तमम् ॥

Vṛddhya Śārṅgadharma.

III.

The sage Uṣanās or Śukrācāryya thus describes¹ the tempering of swords in the Vṛhat Saṃhitā (Kern's trans. Ch. L.) :—

23. The fluid to imbrue a sword with, according to the precepts of Uṣanās, is: blood, if one wishes for a splendid fortune; ghee, if one is desirous to have a virtuous son; water, if one is longing for inexhaustible wealth.

24. An approved mixture to imbrue the sword with, in case of one desirous to attain his object by wicked means, is: milk from a mare, a camel and an elephant. A mixture of fish bile, deer-milk, horse-milk, and goat-milk, blended with toddy, will make the sword fit to cut an elephant's trunk.

25. A sword first rubbed with oil, and then imbrued with an unguent compounded of the milky juice of the Calotropis, goat's horn, ink, dung from doves and mice, and afterwards whetted, is fit for piercing stone.

- ¹ वड्वीष्टकरिणुदुग्धपानं
यदिपानेन समीहतेऽर्थसिद्धिः ।
भ्रष्टपिण्डमृगाय वस्तुदुग्धैः
करिहस्तच्छिदये उतालगर्भैः ॥
आर्कं पयो हुडु विषाणमसीसमेतं
पारवतास्तु शक्ता च युतं प्रलीपः ।
शस्त्रस्य तैलमाधतस्य ततोऽस्य पानं
पशच्छित्तस्य न शिलासु भवेद्विधातः ॥
चारि कदल्या मयितेन युक्ते
दिनीषिते पायितमायसं यत् ।
सम्यक् शितं चाग्नि नैति भङ्गं
न चान्यलीङ्घ्यपि तस्य कौटुम्भम् ॥

26. An instrument imbrued with a stale mixture of potash of plantains with butter milk, and properly whetted, will not get crooked on a stone, nor blunted on other iron instruments.

GOOD AND BAD QUALITIES OF SURGICAL INSTRUMENTS.

Suśruta says¹: "The good points in an instrument are the following : it should have a well-made handle, affording a firm grasp ; it should be made of iron of good quality ; it should have a fine edge, a pleasant shape and a well-finished point ; and it should not be dentated (except the saw)." He gives preference to the Śāstras which are of good make and with a fine edge—so fine as to divide the hairs on the skin and whose handles can easily be grasped by the surgeon's hand.

On the other hand, he points out eight defects² of sharp instruments : they must not be bent, or blunt, or broken, or jagged, or too thick, or too thin, or too long, or too short. Instruments free from these defects should be used. The Karapatra or saw is the only exception, for being used for sawing bones, it requires a jagged or dentated edge. Vāgbhaṭa also mentions these defects.³

¹ तानि सुग्रहाणि सुलोहाणि सुधारानि सुरुपाणि सुसमाहितमुखायण्यकरालानि चेति शस्त्रसम्पत् ।

Suśruta Saṁhitā, I. viii.

² तत्र वक्रं कुण्डं खण्डं खरधारमतिस्थूलमत्यल्पमतिदीर्घमतिऋक्षमित्यष्टौ शस्त्रदोषाः । अती विपरीतगुणमाददीतान्यत्र करपत्रात्तद्धि खरधारमस्थिच्छेदनाय ।

Ibid.

³ कुण्डं-खण्डं-तनु-स्थूल-ऋक्ष-दीर्घल-वक्रताः ।

शस्त्राणां खरधारत्वमष्टौ दोषाः प्रकीर्त्तिताः ॥

Aṣṭāṅga Hṛdaya, I. xxvi.

Suśruta enumerates twelve defects¹ of blunt instruments, viz., it may be too thick, or made of impure metal, or too long, or too short, or incapable of being grasped, or capable of being grasped (unevenly) partially, or bent, or made of too soft material, or of elevated ends, or it may have bent, loose, elevated, and weak pins, or be of weak ends, or of thin sides. These faults refer principally to the *Swastika yantras* or the cruciform instruments.

THE USES OF INSTRUMENTS.

Twenty four different kinds of operations² are said to be performed by the blunt instruments (Suśruta), viz.:—

- | | |
|-----------------|---|
| 1. Nirghātana | ... Extraction by moving to and fro. <i>e. g.</i> śālyanirghātani. |
| 2. Pūrāṇa ... | ... Filling the bladder or eyes with oil. |
| 3. Bandhana ... | ... Bandaging and binding by rope. |
| 4. Vyūhana ... | ... 1. Raising up and incising a part for removing a thorn or 2. bringing together the lips of the wound. |
| 5. Vartana ... | ... Contracting or curling up. |

¹ तत्रातिस्थूलमसारमन्दीर्घमतिरूक्षमयाहि विषमयाहि वक्रं शिथिलमत्युन्नतं शृदुकीलं शृदुमुखं शृदुपाशमिति द्वादश यत्नदीपाः ।

Suśruta Saṁhitā, I. vii.

² यत्नकर्मानि तु निर्घातनपूरणवन्धनव्यूहनवर्तनचालनाविवर्तनविवरणपीडनमार्ग-विशीघनविकर्षणाहरणान्नीलमनविनमनभञ्जनीभ्रयनाचूषणैषणदारणज्वकरणप्रचालनप्रधमन-प्रशान्तनानि चतुर्विंशतिः ।

- | | | |
|---------------------|-----|--|
| 6. Cālana | ... | ... 1. transferring, i.e., removing from one part to another; 2. moving a foreign body. |
| 7. Vivartana | ... | ... Turning round. |
| 8. Vivaraṇa | ... | ... Exposing or opening out any part. |
| 9. Piḍana | ... | ... Pressing as by finger to let out pus from an abscess. |
| 10. Mārga Viśodhana | .. | .. Clearing the canals such as the urethra, rectum &c. |
| 11. Vikarṣaṇa | ... | ... 1. Extraction by pulling; or 2. loosening a foreign body fixed in muscles &c. |
| 12. Āharaṇa | ... | ... Pulling out. |
| 13. Āñcana | ... | ... Pulling up. |
| 14. Unnamana | ... | ... Elevating or setting upright as the depressed cranial bones or ears. |
| 15. Vinamana | ... | ... Depression as of the elevated ends of the fractured bone. |
| 16. Bhañjana | ... | ... 1. Rubbing the head, ears &c.;
2. contusing a part all round before it is surgically operated on. |
| 17. Unmathana | ... | ... Probing or stirring the track formed by an impacted foreign body. |
| 18. Ācuṣaṇa | ... | ... Suction as of poisoned blood and milk by horns, or gourd, or mouth, |

- | | |
|----------------|---|
| 19. Eṣaṇa ... | ... Exploring as by an earth-worm shaped probe, the direction of a sinus or the existence of a foreign body in the wound. |
| 20. Dāraṇa ... | ... Splitting or dividing as the head, ears &c. |
| 21. Rjukaraṇa | ... Straightening anything which is bent. |
| 22. Prakṣāḷana | ... Washing as a wound with water. |
| 23. Pradhamana | ... Blowing as powders into the nose through tubes. |
| 24. Pramārjana | ... Rubbing out as foreign bodies from the eyes &c. |

Vāgbhaṭa recognises only fifteen different kinds¹ of operations performed by the blunt instruments: Nirghātana (moving to and fro), Unmathana (probing), Pūraṇa (filling up), Mārḡa Śuddhi (clearing passages), Saṁvyūhana (raising up and extracting a thorn by incision), Āharaṇa (pulling out), Bandhana (bandaging), Piḍana (pressing), Ācūṣaṇa (suction), Unnamana (elevation), Nāmana (depression), Cāla (movement), Bhaṅga (breaking), Vyāvartana (turning round); and Rjukaraṇa (straightening).

¹ निर्वर्तनोन्मथन पूरण मार्गशुद्धि
 संव्यूहनाद्धरण वन्धन पीडनानि ।
 आचूषणोन्नमन नासन चाल भङ्ग
 व्यावर्तनवृत्तकारणानि च यत्नकर्मा ॥

The śastras or cutting instruments, on the other hand, are said to perform eight kinds of surgical operations (Suśruta).¹

1. Chedana ... Excision or removal of a part of the body by operation as of piles.

Instruments:—Vṛddhipatra, nakhaśastra, mudrikā, utpalapatra, and arddhadhāra.

2. Bhedana ... Incision of a part, as of an abscess.

Instruments:—The same as above.

3. Lekhana ... Scarification or dissection of a skin-flap; or scraping, as of Rohini *i.e.*, surgical diseases of the throat.

Instruments:—Maṇḍalāgra and karapatra.

4. Vedana or Vyādhana ... Puncturing as of veins to bleed patients by instruments having fine points.

Instruments:—Kuṭhārikā, vṛhimukha, āṛā, vetaspatra, and sūcī.

5. Eṣaṇa ... Probing, as of sinus and fistula by a probe.

Instruments:—Eṣaṇī.

6. Āharana. ... Extraction, as of stone by the spoon or hook.

Instruments:—Vaḍiśa, and danta-śaṅku.

¹ तच्च शास्त्रकर्माष्टविधं । तद्यथा । क्लेद्य' भेद्यं लेख्यं वेध्यमेवमाहृत्य' विस्त्राय' सौव्यमिति ।

7. Viśrāvaṇa ... To let out pus as from a deep-seated abscess.

Instruments:—Sūci, kuśapatra, ātīmukha, śarāṛīmukha, antarmukha, trikureccaka, and eṣaṇī.

8. Sivana Stitching, as of the lips of a wound by needles.

Instruments:—The different kinds of sūci or needles.

Caraka mentions, however, six kinds¹ of operations:—

1. Pātana Incision, as in operation for sinus, abscess, intestinal injury, and deeply impacted foreign bodies.
2. Vyādhana ... Tapping or piercing, as in operations for ascites, suppurating tumour, ovarion tumour, boils &c.

- ¹ पाटनं व्यधनञ्चैव च्छेदनं लेपनं तथा ।
 प्रोच्छन्नं सौवनञ्चैव षड्विधं शस्त्रकर्म तत् ॥
 नाडीव्रणाः पक्वशोथस्तथा क्षतगुदीदरम् ।
 अन्तःशल्याश्च ये देशाः पाथ्यास्ते तद्विधाश्च ये ॥
 दन्तीदराणि संपन्ना गुल्माः ये ये च रक्तजाः ।
 व्यध्याः शोणितरीगाश्च वीसर्पपिडकादयः ॥
 उद्वहत्तान् रघूलपर्यन्तानुत्सन्नान् कठिनान् व्रणान् ।
 अशःप्रभृत्यधीमांसं छेदनेनोपपादयेत् ॥
 क्लिप्तासानि मुकुष्ठानि लिखेल्लेख्यानि बुद्धिमान् ॥
 वातासृग्ग्रन्थिपिडकाः सकीटा रक्तमण्डलाः ।
 कुष्ठान्यभिहितञ्चान्नं शोथान्य प्रच्छेद्विषक् ॥
 सौव्यं कुक्ष्यादराद्यन्तु गम्भीरं यद्विपाटितं ।
 इति षड्विधमुद्दिष्टं शस्त्रकर्म मनोविभिः ॥

- | | | |
|------------------|-----|---|
| 3. Chedana ... | ... | Excision, as in the operation for tumours, raised and thickened <i>vraṇa</i> or corns, and piles. |
| 4. Lekhana ... | ... | Scraping, as in operation for some varieties of skin diseases. |
| 5. Pracchana ... | ... | Scarifying, as in the operations for glands, boils, leprous nodules, inflammatory swellings, &c. |
| 6. Sībana ... | ... | Sewing, as in the operation of laparotomy* for deep seated diseases in the abdomen. |

Vāgbhaṭa describes thirteen kinds¹ of operations performed by the sharp instruments :—

- | | | |
|------------------|-----|--|
| 1. Utpātana ... | ... | Raising up by incision, as by the Nakhaśāstra. |
| 2. Pātana ... | ... | Incision as by the Vṛddhipatra. |
| 3. Sīvana ... | ... | Stitching as by the Sūci. |
| 4. Eṣaṇa ... | ... | Probing as by the Eṣaṇi. |
| 5. Lekhana ... | ... | Scraping as by the Maṇḍalāgra. |
| 6. Pracchana ... | ... | Scarification as by the Maṇḍalāgra. |
| 7. Kuṭṭana ... | ... | Pricking as by the Sūci in tattooing. |
| 8. Chedana ... | ... | Excision as by the Vṛddhipatra. |

¹ उत्पाद्य पात्य सीव्यैश्च-लेख्य-प्रच्छन्न कुट्टनम् ।

हेतुं भेद्यं व्यधी मन्यो यद्वा दाहश्च तत्क्रियाः ॥

- | | | |
|--------------|-----|---------------------------------|
| 9. Bhodana | ... | Piercing as by the Sharp Eṣaṇī. |
| 10. Vyadhana | ... | Tapping as by the Vetasapatra. |
| 11. Manthana | ... | Churning as by the Khaja. |
| 12. Grahana | ... | Fixing as by the Sandamśa. |
| 13. Dahana | ... | Burning as by the rods. |

WHETSTONE.

In the R̥gveda we find the use of stones mentioned for whetting the edges of the arms of war.¹ The Hindu surgeons used a stone slab for sharpening the śāstras or edged instruments.² It was of the colour of māṣa (Phascolus Roxb.). The whetstones used by the Greeks and Romans were either the marble ointment slabs, or made of clay slate or sandy schistaceous shale.

INSTRUMENT CASES.

To preserve the edges of the cutting instruments, a case made of the wood of śalmālī (Bombax Malabaricum) was used (Suśruta).³ Such cases were also manufactured of canvas, or wool, or silk, or leather. These cases—twelve *anguli* (*i.e.*, fingers' breadth) long and nine *anguli* broad—were well sewn and

¹ See R̥gveda, Mandala. 2 Sūkta. 39 Verse 7.

„ 9 „ 90 „ 1.

„ 9 „ 112 „ 2.

„ 10 „ 53 „ 9.

„ 19 „ 101 „ 2.

² तेषां निशानार्थं शस्त्रशिला माधवर्णा ।

Suśruta Saṁhitā, I. viii.

³ धारसंस्थापनार्थं शाल्मली फलकमिति ।

consisted of compartments, lined with wool and separated by partitions for each instrument. They could be folded, closed with a rod and firmly tied by a knot.¹ The barbers of India still use similar cases for their instruments.

That the razor used to be kept in a case, we know from a passage in the Vṛhadāraṇyaka (800 to 500 B. C.) where the author says "It (the Atman) is here all-pervading down to the tips of the nail. One does not see it any more than a razor hidden in its case or fire in its receptacle".²

¹ स्थानवाङ्गुलि विस्तारः सुघनी द्वादशाङ्गुलः ।
 चौम पट्टीर्णं कौषेय दुकूलं स्रुतं चर्मजः ॥
 विन्यस्त पाशः सुस्यूतः सान्त्त रीर्णास्थ शस्त्रकः ।
 शलाका पिहितस्थश्च शस्त्रकोषः सुसञ्चयः ॥

Aṣṭāṅga Hṛdaya, I. xxvi.

अथ शस्त्राणां सुरक्षार्थं शस्त्रकोषं माह स्यादित्यादि । नवाङ्गुलि विस्तारः नवाङ्गुल परिमाणविस्तारविशिष्टः शस्त्रकोषः स्यात् । शस्त्रस्य कोषः शस्त्रकोषः । कोषं चाप् इति लोके । यथा असिकोष इत्यादि । तथा स्रुतः, घनी, निविडः सुघनः तथा द्वादशाङ्गुलः दैर्घ्येण द्वादशाङ्गुल परिमाणः, तथा चौमादिजः । तथा विन्यस्तः यथा क्रमेण कृतः पाशो यस्य स विन्यस्तपाशः । तथा स्रुतः, सूतः कृतं सेवनः, सुस्यूतः तथा सान्त्तराणि सव्यवधानानि, ऊर्णास्थानि मेघादिलोममध्ये स्थितानि, शस्त्रानि यस्मिन् स सान्त्तरीर्णास्थशस्त्रकः । तथा शलाकायाः पिहितं स्थितं आस्थं मुखं यस्य स शलाकापिहितस्थ तथा स्रुतः सञ्चयी, नापित भाण्डिकवद्राशीकरणं यस्य स सुसञ्चयः । चौमं अतसीस्त्वभववस्त्रं केन्विस् ख्यातः । दुकूलशब्दः पट्टादिभिः स्त्रिभिः सम्बध्यते । तेन पट्टदुकूलं पाट् इति ख्यातेन सूत्रेण निर्मितं वस्त्रं ऊर्णा, मेघादिलोमं तद्वत् वस्त्रं और्णं दुकूलवन्नात् इत्याख्य वस्त्रादि । कौषेयदुकूलं कोषकार-कौटर्भव स्त्रेण रेश्म इति ख्यातेन निर्मितं वस्त्रं ।

Vāgbhaṭārtha Kaumudi.

² Vṛhadāraṇyaka, I. iv.

To prove that portable cases for medicaments and instruments were in use in ancient India, we quote *in toto* from the Mohāvāgga some references to them.¹

BOXES FOR OINTMENTS, OINTMENT POTS, AND PORTABLE CASES.

Now at that time, the Bhikkhus used to put pulverised ointments into pots and saucers. They became sprinkled over with herb-powder and dust.

They told this thing to the Blessed One.

"I allow, O Bhikkhus, the use of a box for ointment".

Now at that time the Kḷabbaggiya Bhikkhus used to carry about various kinds of boxes for ointments—gold ones and silver ones. People were annoyed, murmured and became angry, saying, "Like those who still live in the world."

They told this thing to the Blessed One.

"Various kinds of boxes for ointments, gold ones, and silver ones, are not, O Bhikkhus, to be used. Whosoever does so, is guilty of a dukkata offence. I allow, O Bhikkhus, the use of such boxes made of bone, or ivory, or horn, or of the nāla reed, or of bambu, or of wood, or of lac, or of the shells of fruit, or of bronze, or of the centre of the chank-shell (Sankhu-navi)."

2. Now at that time the boxes of ointment had no lid. (The ointment) was sprinkled over with herb-powder and dust.

They told this thing to the Blessed One.

¹ Mohāvāgga vl. 12. (Sacred Books of the East).

"I allow you, O Bhikkhus, the use of a lid."

The lid used to fall off.

"I allow, O Bhikkhus, to fasten the lid with thread and tie it on to the box."

The boxes used to fall.

"I allow you, O Bhikkhus, to sew the boxes on with thread".

3. Now at that time the Bhikkhus used to rub ointment on with their fingers, and the eyes were hurt.

They told this thing to the Blessed One.

"I allow, O Bhikkhus, the use of a stick or holder to put the ointment on with".

Now at that time the *Khabbaggiya* Bhikkhus used to keep various kinds of ointment-sticks—gold ones, and silver ones. People were annoyed, murmured, and became angry, saying, "Like those who still live in the world".

They told this thing to the Blessed One.

"Various kinds of ointment-holders, O Bhikkhus, are not to be used. Whosoever does so, is guilty of a dukkata offence. I allow, O Bhikkhus, the use of ointment-holders of bone, or of ivory, or of horn, or of the *nāla* reed, or of bambu, or of wood, or of lac, or of fruit, or of bronze, or of the chank-shell."

4. Now at that time the ointment-sticks used to fall on the ground and become rough.

They told this thing to the Blessed One.

"I allow, O Bhikkhus, the use of a case for the ointment-sticks".

Now at that time the Bhikkhus used to carry the ointment-boxes and ointment-sticks about in their hands.

They told this thing to the Blessed One.

"I allow, O Bhikkhus, the use of a bag to put the ointment-box in."

They had no shoulder strap.

"I allow you, O Bhikkhus, the use of a shoulder strap (by which to carry the ointment-box), or of a thread (by which to sew or tie it on)."

13.

1. Now at that time the venerable Pilindavakkha had head-ache.

"I allow, O Bhikkhus, the use of a little oil on the head".

(The disease) became no better.

"I allow, O Bhikkhus, the practice of taking up (medicine) through the nose". (See commentary on the Dhammapada, pp. 83.)

The nose ran.

"I allow, O Bhikkhus, the use of a nose-spoon" (Natthukarāṇi).

Now at that time the Kḷabbaggiya Bhikkhus had various kinds of nose-spoons—made of gold, and of silver. People were annoyed, murmured, and became angry, saying, "Like those who still live in the world."

They told this thing to the Blessed One,

“Various kinds of nose-spoons, O Bhikkhus, are not to be used. Whosoever does so, is guilty of dukkata offence. I allow, O Bhikkhus, the use of such nose-spoons made of bone, (&c., as in chap. 12, 1, down to :) the chank-shell.

2. The nose took up the medicament in unequal proportions.

“I allow, O Bhikkhus, the use of a double nose-spoon (yamaka-natthu-karaṇī).”

They used to spread the drugs on a wick before they sniffed up the aroma; and their throats got burnt.

‘I allow, O Bhikkhus, the use of a pipe to conduct the aroma.’

Now at that time the Khabbaggiya Bhikkhus had various kinds of pipes (&c., as in the last clauses of § 1, down to the end).

Now at that time the aroma-pipes came open: and worms got in.

‘I allow, O Bhikkhus, the use of a lid to the pipes.’

Now at that time the Bhikkhus carried the pipes about in their hands.

‘I allow, O Bhikkhus, the use of a bag to carry the aroma-pipes in’.

The aroma-pipes rubbed against one another.

‘I allow, O Bhikkhus, the use of a double bag.’

They had no shoulder strap.

‘I allow, O Bhikkhus, the use of a shoulder strap (by which to carry the double bag), or of a thread (by which to sew it on),

OPERATION TABLE.

In the examination for piles, Suśruta directs the patient to lie down on his bed or on a board¹; and in describing the operation, Vāgbhaṭa II mentions a board to be used as an operationtable.² A similar bed, as long as the distance from the top of the head to the knees of the patient, is also mentioned in the description of the lithotomy operation.³ The use of a board as a fracture bed is also advised.

For passing the tubes of the *vasti-yantra* or clysters into the urethra in the male, the patient is recommended to sit on a stool as high as his knees (*jānumātrāsana*).⁴

In phlebotomy, the patient is advised to sit on a stool, an aratni high⁵ (i.e. the distance between the tip of the olecranon process of the ulna to the tip of the little finger).

¹ भुक्तवन्तमुपवेश्य सञ्चते शुची देशे साधारणे व्यर्धे काले समे फलके शय्यायां वा प्रत्यादित्य-
गुदनव्यस्रोत्सङ्गे निषण्णपूर्वकायमुत्तानं * * * *

Suśruta Saṁhitā, IV. vi.

² शुचिं कृतस्वस्थं भुक्तविष्णुवमव्ययम् ।

शयने फलके दान्यनरोत्सङ्गे व्यापयितम् ॥

Aṣṭāṅga Hṛdaya, VI. viii.

³ ततो बलवन्तमविकृतवमाजानुसमे फलके प्रागुपवेश्य पुरुषश्च तस्योत्सङ्गे निषण्णपूर्वकाय-
मुत्तानमुन्नतकटीकं ।

Suśruta Saṁhitā, IV. vii.

⁴ स्नातस्य भूक्तस्य रसेन पयसापि वा ।

स्रष्टविष्णुवगस्य पीठे जानुसमे सद्वी ॥

Caraka Saṁhitā, VIII. ix.

⁵ तच्च व्यधसिरं पुरुषं प्रत्यादित्यमुखमरविमाजीकृते उपवेश्यासने ।

Suśruta Saṁhitā, III. viii.

अग्नितापातपखिन्नो ज्ञान्वासनसंस्थितः ।

अदुपहृतकीशान्ती जानुस्थापितकर्परः ॥

Aṣṭāṅga Hṛdaya, I. xxvii.

KAPĀTA-ŚAYANA OR FRACTURE-BED.

In the treatment of fractures of the lower extremities, mention is made of the *kapāta-śayana* (lit. door-bed) or fracture-bed, consisting of a plank of wood resembling the panel of a door.¹ The patient is to lie down on it. The board has five rods fixed to it, to which the fractured limb is tied to prevent any movement: two on each side of the joint and one on the plantar surface of the foot. Dallāṇa explains it thus²: In fractures of the bones of the leg, two rods are fixed on each side of the ankle and one supports the foot; in fracture of the thigh bone, two rods are fixed on each side of the knee or hip, and one under the foot. In a double fracture of the thigh bone and bones of the

१ अथ जङ्गोरुभग्नानां कपाटशयनं हितं ।
 कौलका वन्धनार्थं पञ्च कार्या विजयता ।
 यथा न चलनं तस्य भग्नस्य क्रियते तथा ।
 सन्धेरुभयतौ द्वौ द्वौ तले चैकश्च कौलकः ।
 श्रोण्यां वा पृष्ठवंशे वा वक्षस्यचक्रयोस्तथा ।
 भग्नसन्धिविमोक्षेषु विधिमेन' समाचरेत् ॥

Suśruta Saṁhitā, IV. iii.

२ जङ्गोरुभङ्गेषु पञ्चात् कर्मविशेषं निर्दिशन्नाह । अथ जङ्गल्यादि । जङ्गोरुभग्न-
 चिकित्सितमाह । भग्नानाम् काण्डभग्नानाम् । द्विविधानामपीत्यपरे । कपाटशयनमवश्यं
 कार्यम् । चलनम् कपाट शयनेनैव सह देशान्तरनयनार्थम् । आधारभूतशयनचालनार्थ-
 नित्यम् । आधेयभूतशरीरावयवचलन परिहारार्थं कौलाः । कौलानां पञ्चसंख्यात्मकम् ।
 जङ्गोर्वर्धयोरेकतरस्य भग्नमेवेत्य तव जङ्गाभग्नं तु गुल्फसन्धेरुभयतो द्वौ एकश्च तले एवं पञ्च ।
 जङ्गभग्नं जानुसन्धेरुभयतो द्वौ द्वौ । वङ्गासन्धेरुभयतस्तले चैक इत्यत्रापि पञ्च । उभयभङ्गा-
 पेक्षया तु सप्तभिरेव कौलैर्यन्त्रणम् । तथाह उभयतो वह्निर्द्वौ गुल्फयोर्द्वौ च जानुनोः द्वौ च
 वङ्गयोः तले चैक एवं सप्त । अथ जङ्गोर्वोः पार्श्वयोर्वो द्वौ तले चैकश्च कौलक इति केचित्
 पठन्ति । तन्निवन्धकारिणं पठितम् । तस्मान्न पठनीयम् । गयदासश्चात्र पाठान्तरं किमपि
 पठति । तस्माभावात् लिखितम् ।

Dallāṇa's Commentary, IV. iii.

leg, seven rods are required,—two on the outer side of the ankle, knee, and groin, respectively, and one under the foot. The fracture-bed is recommended to be similarly availed of in fractures and dislocations of the loin, the spinal column, the chest, and the clavicle. And this mode of treatment, he adds, may advantageously be used for the other kinds of fractures and dislocations. Vāgbhaṭa II also mentions it in the treatment of fractures¹.

Hippocrates used a similar fracture-bed for the proper treatment of fractures and dislocations. It was called Scammum Hippocratic or bench of Hippocrates. As the figures of this bench would elucidate the structure of the *kapāta-śayana*, we reproduce here three plates with their explanations given at the end of Vol. II, Genuine Works of Hippocrates (Syed. Soc. Ed.), and two plates—Scammum Hippocratis and Plinthium Nileii from the Collection De chirurgiens Grecs.

Fig. 1. The Scammum Hippocratis or Bench of Hippocrates, as represented by Andreas a Cruce (*Officina chirurgicalis venetis*, 1596).

Fig. 2. The same as represented by M. Littré.

A. A board, 6 cubits long, 2 broad and 12 inches thick ; not 13 as incorrectly stated by M. Littré.

B. The feet of the Axles, which are short.

¹ कटी जङ्घोर्ध्वग्रानां कपाटशयनं हितम् ।
 यन्त्रणार्थं तथा कीलाः पञ्च कार्या विवक्षिताः ॥
 जङ्घोर्वोः पार्श्वयोर्दो द्वौ तल एकश्च कीलकः ।
 श्रोण्यां वा पृष्ठवंशे वा वक्रस्याचकयोस्तथा ॥

CC. Axle-trees.

DD. Grooves 3 inches deep, 3 broad, separated from one another by 4 inches.

E. A small post or pillar, fastened in the middle of the machine in a quadrangular hole.

F. Pillars a foot long.

G. A cross-beam laid on the pillars FF, which can be placed at different heights by means of holes in the pillars.

Fig. 3. Representation of the mode of reducing dislocation of the thigh outwards, as given by M. Littré (*Œuv. d'Hipp.*, tom. iv, p. 305).

A mistake in the figure given by M. Littré is here corrected.

A. A lever applied to the nates of the luxated side, and acting from without inwards, in order to bring the head of the bone into its cavity.

B. Another lever, held by an assistant, put into one of the grooves of the machine, and intended to act against lever A.

C. Grove in which the end of the lever A takes its point of support.

D. The luxated member.

EE. Extension and counter-extension.

Fig. 4. Banc d'Hippocrate, d'après Rufus, servant à réduire différentes luxations. (Collection De Chirurgiens Grecs, Bibliothèque Nationale).

Fig. 5. Plinthium, ou cadre de Nileus, d'après Héliodore. (Ibid).

CHAPTER IV.

THE NUMBER OF SURGICAL INSTRUMENTS.

The armamentarium of the Hindu surgeons consisted of a good number of surgical instruments. They are described to be of two kinds, the *yantras* and the *śastras*, i.e., the blunt and the sharp instruments. Suśruta enumerates no less than one hundred and one varieties of the blunt instruments, and twenty different kinds of sharp instruments. Hārīta, on the other hand, enumerates twelve blunt instruments, twelve sharp instruments, and four *prabandhas*, as necessary for the operation of extraction of arrows and other foreign bodies.¹ Vāgbhāṭa II mentions one hundred and fifteen kinds of blunt and twenty-six kinds of sharp instruments. Pālakapya (Treatment of Elephants) mentions ten kinds of *śastras* or sharp instruments though he describes the uses of other instruments required for the surgical treatment of diseases.

INSTRUMENTS AND THEIR CLASSIFICATION (SUŚRUTA.)

Of the one hundred and one varieties of the blunt instruments, the surgeon's hand is rightly considered as the principal instrument, for without its help, no instrument can properly be used, and every surgical operation is under its control.² They are recommended to be used for the extraction

¹ वादशेव तु यन्त्राणि शस्त्राणि वादशेव तु ।

चत्वारि च प्रवन्धानां शस्त्रीद्वारे विनिर्दिशेत् ॥

² यन्त्रशतमेकोत्तरमत्र दशमेव प्रधानतमं यन्त्राणामवगच्छ । किं कारणं । यन्त्राणां सादृते यन्त्राणामप्रवृत्तिरिव तदधीनत्वाद्यन्त्रकर्मणां ।

तत्र मनःशरीरावाधकराणि शस्त्राणि तेषामाह्वरणीयायै यन्त्राणि ।

of *śalya* or foreign bodies, *e.g.*, a dart, an arrow, a javelin, a spear, a peg, a pin, a bamboo rod, a stake &c. which cause pain to the body and mind.

A. Suśruta subdivides the blunt instruments into six classes,¹ viz.:

I. Svastika or cruciform instruments	...	24 kinds,
II. Sandamśa or pincher-like	...	2 "
III. Tāla or picklock-like	...	2 "
IV. Nālī or tubular or hollow	...	20 "
V. Śalākā or rod or pricker-like	...	28 "
VI. Upayantra or accessory	...	25 "

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These instruments are advised to be made generally of iron, or of other suitable materials, when iron is not available. Their ends often resemble the faces of some ferocious beasts, or of deers, or birds. Hence the instruments should be so constructed as to have the likeness of their faces, following at the same time the directions of scientific treatises, or the instructions of teachers, or in imitation of other instruments, or in adaptation to the exigencies of the time. They should be of reasonable

¹ तानि षट्प्रकाराणि । तद्यथा । खलिकयन्त्राणि । सन्दंशयन्त्राणि । तालयन्त्राणि । नाडीयन्त्राणि । शलाकायन्त्राणि । उपयन्त्राणि चेति । तत्र चतुर्विंशति खलिकयन्त्राणि । हे सन्दंशयन्त्रे । हे एव तालयन्त्रे । विंशतिर्नाड्यः । षट्विंशतिः शलाकाः । पञ्चविंशति रुमयन्त्राणि ।

Suśruta Saṁhitā, I. vii.

Hessler translates the terms as follows : *Uncinata instrumenta*, *forcipum instrumenta*, *palmiformia instrumenta*, *hamata instrumenta*, *secundaria instrumenta*,

Hessler's Suśruta, I. vij.

size, with their ends rough or smooth as required. They should be of strong make, good shape and capable of a firm grasp.¹

I. The Svastika or Cruciform instruments are—

1. Śiṃhamukha. 2. Vyāghramukha. 3. Vṛkamukha.
4. Tarakṣumukha. 5. Ṛkṣamukha. 6. Dvīpimukha.
7. Mārjāramukha. 8. Śṛgālamukha. 9. Airvāvṛkamukha.
10. Kākamukha. 11. Kaṅkamukha. 12. Kuraramukha.
13. Cāsamukha. 14. Bhāsamukha. 15. Śāśaghātīmukha.
16. Ulūkamukha. 17. Cillimukha. 18. Gṛdhramukha.
19. Śyenamukha. 20. Krauñcamukha. 21. Bhṛṅgarājamukha.
22. Añjalikarmamukha. 23. Avabhañjanamukha, and
24. Nandimukhamukha.

II. The Sandaṁśa or pincher-like instruments are—

1. Forceps with arms.
2. Forceps without arms.

¹ तानि प्रायशी लौहानि भवन्ति तत्प्रतिरूपकाणि वा तदलाभे । तत्र नानाप्रकाराणां व्यालानां मृगपक्षिणां मुखेर्मुखानि यन्त्राणां प्रायशः सदृशानि तस्मात्तत्सारूप्यादागमादुपदेशादन्यथदर्शनादुक्तितय कारयेत् ।

समाहितानि यन्त्राणि खरश्च॥मुखानि च ।

सदृशानि सुरूपाणि सुग्रहाणि च कारयेत् ॥

Suśruta Saṁhitā, I. vii.

अनेकरूपकार्याणि यन्त्राणि विविधान्यतः ।

विकल्पा कल्पयेद् बुद्ध्या यथास्थूलन्तु वक्ष्यते ॥

* * * * *

अलौहान्यनुशस्त्राणि तान्येवञ्च विकल्पयेत् ।

अपराण्यापि यन्त्रादीन्यपयोगञ्च यौगिकम् ॥

Aṣṭāṅga Hṛdaya, I. xxv.

III. The Tāla or picklock-like instruments are—

1. Ekatāla.

2. Dwitāla.

IV. The Nāḍī or tubular instruments are—

For fistula-in-ano ...	(1) with one slit; (2) with 2 slits ...	2
For piles ...	(1) with one slit; (2) with 2 slits ...	2
For wounds ...	... ..	1
For clysters (Rectal) ...	(Some authors describe 3 only) ...	4
For clysters (vaginal and urethral)...	(male and female) ...	3
For Hydrocele ...	... ..	1
For Ascites ...	... ..	1
For fumigation and inhalation	... ..	3
For Urethral Stricture	... ..	1
For Rectal „	... ..	1
For Cupping—gourd	... ..	1
		<hr/> 20

V. The Śalākā or rod-shaped instruments are—

Gaṇḍūpadamukha or earth-worm like	... ..	2
Śarapūṅkhamukha or arrow-stem like	... ..	2
Sarpapaṇamukha or snake's hood like	... ..	2
Vaḥṣīsamukha or fish-hook like	... ..	2
Masūradalamukha or masūra pulse like	... ..	2
Promāṛjana or swabs	... ..	6
Khallamukha or spoons	... ..	3
Jāmvavavadana or jambul seed like	... ..	3
Aṅkuśavadana or goad like	... ..	3
Kolāsthidalamukha or plum seed like	... ..	1
Mukulāgra or bud shaped	... ..	1
Mālatīpuṣpavṛntāgra or like the stem of mālatī flower		1
		<hr/> 28

VI. The Upayantra or accessory instruments are—

1. Rajju—thread. 2. Venikā—twine. 3. Paṭṭa—bandages.
4. Carma—leather. 5. Valkala—bark of trees. 6. Latā—creepers.
7. Vastra—cloth. 8. Aṣṭhīlāśma—stone or pebble.
9. Mudgara—hammer. 10. Pāṇipādātala—palm of the hand and sole of the foot.
11. Aṅguli—finger. 12. Jihvā—tongue.
13. Danta—tooth. 14. Nakha—nail. 15. Mukha—mouth.
16. Vāla—hair. 17. Aśvakāṭaka—the ring of a horse's bridle.
18. Śākhā—branch of a tree. 19. Sṭhivana—spittle.
20. Pravāhaṇa—fluxing the patient. 21. Harṣa—objects exciting happiness.
22. Ayaṣkānta—a loadstone. 23. Kṣāra—caustic.
24. Agni—fire. 25. Bheṣaja—medicines.

B. The sharp instruments or śastras are—

1. Maṇḍalāgra or round headed knife.
2. Karapatra or saw (*lit.* like the human hand).
3. Vṛddhipatra (*lit.* like the leaf of vṛddhi—an unknown medicinal plant)—a razor.
4. Nakha-śastra or nail-parer.
5. Mudrikā or finger-knife (like the last phalanx of the index finger).
6. Utpalapa'ra, a knife, *i.e.*, resembling the petal of a blue lotus, (*Nymphaea stellata*, Willd).
7. Arddhadhāra or a single-edged knife.
8. Sūci—needles.
9. Kuśapatra—a knife shaped like the kuśa grass (*Eragostis Cynosuroides*).

10. Ātī mukha—a knife shaped like the beak of the Ātī bird (Turdus Ginginianus).
11. Śararī-mukha—a pair of scissors like the beaks of Śararī bird.
12. Antarmukha (*lit.* having internal sharp edge)—a kind of scissors.
13. Trikureccaka—an instrument consisting of three needles.
14. Kuṭhārikā—a small axe shaped instrument.
15. Vrihimukha—a trocar shaped like a grain of rice.
16. Arā or awl.
17. Vetasa-patraka—an instrument shaped like the leaf of a rattan (Calamus Rotang).
18. Vāḷiśa—an instrument shaped like the fish-hook.
19. Dantaśaṅku or tooth-pick.
20. Eṣani or sharp probe-like instrument.

According to Hārīta¹ the twelve blunt instruments are—

1. Godhāmukha or iguana-faced.
2. Vajramukha—gṛdhra-mukha?
3. Tribaktra or three faced.
4. Sandaṁśa or pincher.

¹ गोधामुखं वज्रमुखं त्रिवक्त्रं नाम सन्देशचक्राक्तिकङ्कपादम् ।

अथानकं शङ्खककुण्डलञ्च श्रीवत्ससौवत्सिक पञ्चवक्त्रं ।

दादशैतानि यन्त्राणि कथितानि भिषग्वरैः ।

अथ शस्त्राणि प्रोक्तानि नामानि च पृथक् पृथक् ।

अर्द्धचन्द्रं ब्रीहिमुखम् कङ्कपत्रं कुठारिका ।

केरवीरकपत्रञ्च शलाककरपत्रकम् ।

वडिशं गृध्रपादञ्च शूलौ च सूचिसुद्गरम् ।

शस्त्राख्ये तानि प्रोक्तानि शल्योद्धारि पृथक् पृथक् ॥

5. Cakrākṛti or circular shaped. 6. Anaka? 7. Kaṅkapāda?
 8. Śṛṅga or horn. 9. Kundala? 10. Śṛṅbatsa? 11. Saubatsika?
 12. Pañcabaktram, i.e., five faced—simhamukham?

The twelve sharp instruments of Hārta are—

1. Arddhacandra or half-moon shaped. 2. Vṛhimukha.
 3. Kaṅkapatra. 4. Kuṭhārikā. 5. Karavīrakapatraka. 6. Śalākā
 or sharp probe. 7. Karapatraka or saw. 8. Vaḍiśa or sharp
 hook. 9. Gṛdhrapāda? 10. Śūlī 11. Sūci or needle. 12. Mud-
 gara or hammer?

Vāgbhaṭa II classifies the instruments in the following way :-

A. Blunt instruments—

I. Svastika, as heron, lion, bear, crow, deer

forceps &c. ... 24

II. Sandaṁśa: It consists of two iron
 blades soldered at one end, the other

ends being free ... 2

(a) for extraction of eyelashes &c. ... 1

(b) mucuṭi ... 1

III. Tāla ... 2

(a) Ekatāla ... 1

(b) Dvitāla ... 1

IV. Nālī or tubular: ... 23

(a) Kaṇṭhaśalyāvalokini or throat speculum

having three and five holes ... 2

(b) Śalyanirghātani ... 1

(c) For piles, different sizes for male and
 female ... 6

For inspection: 2 holes—rectal speculum 2

For medication: 1 hole ... 2

For applying pressure: entire—sāmi ... 2

(d) For fistula-in-ano: with one and two holes	2
(e) For nasal polypus &c.	1
(f) Aṅguli-trāṇaka or finger-guard ...	1
(g) Joni-vraṇekṣaṇa or vaginal speculum ...	1
(h) Vrāṇo vasti or wound syringe ...	1
(i) For dakodara or Paracentesis abdominis	1
(j) Vastiyāntra or clysters: rectal, vaginal and urethral	3
(k) For fumigation... ..	1
(l) Cupping instruments: Alābu, Ghaṭīyantra and Horns	3
	<hr/>
	23

V. Śalākā or rod-like instruments ... 34

(a) Gaṇḍūpadamukha or earth-worm shaped	2
(b) Masūradalabaktra	2
(c) Śaṅku	9
Faṇībaktra or snake's hood ...	2
Śarapuṅkamukha	2
Vaḥīṣa or blunt hook	2
Garvaśaṅku or delivery hook ...	1
Aśmarī or lithotomy hook ...	1
Śarapuṅkanukha or tooth extractor ...	1
(d) For wiping out discharges ...	6
For rectum	2
• For nose	2
• For ears (kaṇṇaśodhana) ...	2
(e) For application of actual and potential cauteries	11
Jāmvobouṣṭha, three for each ...	6

Arddhendu or half-moon shaped, for hernia	1
Kolāsthidala for nasal polypus	... 1
Nail-shaped	... 3
(f) For cleansing	... 3
Rectum	... 1
Vagina	... 1
Urethra	... 1
(g) Collyrium probe	... 1
	<hr/> 34

VI. Anuyantra or accessory instruments are nineteen in number. To the list of Suśruta he adds the following¹ :—

Goat's gut, silk, time, suppuration, and fear.

B. The sharp instruments of Vāgbhaṭa are twenty-six in number.²

1. Mandalāgra. 2. Vṛddhipatra. 3. Utpalapatra. 4. Adhyarddhadhāra. 5. Sarpāsya. 6. Eṣanī:—Gaṇḍūpadamukhā and Sūcī-mukhā. 7. Vetasa. 8. Śarārī. 9. Trikurecāka. 10. Kuśapatra. 11. Ātīvadana. 12. Antarmukha and Arddhacandrānan. 13. Vrihibaktra. 14. Kuṭhārī. 15. Kuravakasalā. 16. Aṅguli-śastra. 17. Vaḍīśa. 18. Karapatra. 19. Kartarī. 20. Nakhaśastra. 21. Dantalekhana. 22. Sūcī. 23. Kurcca. 24. Khaja. 25. Ārā. 26. Karṇavedhanī.

¹ अनुयन्त्राण्यस्कान् रज्जु वरुणश्च सुद्वराः ।

पृष्ठान् जिह्वा वालाश्च शाखा नख सुख द्विजाः ॥

कालः पाकः करः पादोभयं हर्षश्च तत् क्रियाः ।

उपायवित् प्रविभज्जदालोच्य निपुणं धिया ॥

Aṣṭāṅga Hṛdaya. I. xxv.

² षड्विंशतिः सुकर्मारैर्घटितानि यथाविधि ।

शस्त्राणि रोमवाहीने बाहुल्येनाङ्गुलानि षट् ॥

सुरूपाणि सुधाराणि स्रग्हाणि च कारयेत् ।

अकरलानि सुभ्रात सुतौल्यावार्त्ततेऽयसि ॥

Bhāvamiśra mentions the following blunt and sharp instruments: Eṣaṇī, Jāmvouṣṭha Śālā,¹ Sūci² and knives generally in making incisions which should be shaped like Kharjjūrapatrika, (like the leaf of Kharjjūra tree, Phoenix Sylvestris, Roxb.) Arddhacandra, Candravarga, Sūcimukha and Abāñmukha.³

Pālakapya⁴ mentions ten kinds of śastras :—1. Vṛddhipatra. 2. Kuśapatra. 3. Mandalāgra. 4. Vrihimukha. 5. Kuṭhārī. 6. Vatsadanta. 7. Utpalapatra. 8. Śālākā. 9. Sūci or needles. 10. Rampaka. Besides these he refers to Vaḷīśa.

Of the blunt instruments he mentions:—Jāmvobouṣṭha—(four in number, for application of actual cauteries), Sīmhadamṣṭrā, Godhāmukha, Kañkamukha, Kulīsamukha—(for extraction of foreign bodies), Eṣaṇī or probes (three), wound syringe, Vastīyantra, Śālākā or rods, yaṣṭhiyantra, Karkataka, Dyātūha, Makaraka (crocodile), Śārdḍulamauṣṭhika (tiger's claws), Nandimukha (Turdus Ginginianus).

¹ एषाण्या गतिमन्विष्य चारसूत्रानुसारिणीम् ।

सूचीं निदध्यादत्यन्ते प्रोद्गास्याय विनिहरित् ॥

Bhāva Prakāśa, II. iv., Nāḍī Vrañadhikāra.

² आगन्तुजे भिषगाङ्गीं शस्त्रेणीत्कृत्य यवतः ।

जाम्बीलीनाद्रिवर्णेन तप्तया वा शलाकया ॥

Ibid, Bhagandarādhikāra.

³ गतिमन्विष्य शस्त्रेण हिन्दात् खर्जूरपतिकम् ।

चन्द्रादं चन्द्रवर्गञ्च सूचीमुखमवाङ्मुखम् ॥

Ibid.

⁴ तत्र शस्त्राणि दशनामसंस्थानानि भवन्ति । तद्यथा वृद्धिपत्रम्, कुशपत्रम्, मण्डलायम्, व्रीहिमुखम्, कुठाराकृति, वत्सदन्तम्, उत्तपलपत्रम्, शलाका, सूची, रम्पकश्चेति । फालजाम्बवतापिकादध्याकृतयश्चेति । एतान्याग्निकर्मविधाने चत्वारि चान्यानि शल्यश्चरणानि यथायीगं सिंहद्रष्टुं गोधामुखं कङ्कमुखं कुलिशमुखं चेति । तिस्र एषिण्यः ।

Hastī Āyūrveda, III. xxx.

CHAPTER V.

DESCRIPTION OF THE BLUNT INSTRUMENTS.

Now we shall describe the instruments in detail. The Yantras or the blunt instruments will be considered first, and next the Śastras or the sharp instruments.

I. The Svastika yantra or Cruciform Instruments.

The word svastika is a technical term signifying one of the twenty-four signs of the Jinas; and it can be represented by two lines crossing each other, the arms of the cross being bent at their extremities towards the same direction. So these instruments may be described as cruciform. They have, as a rule a length of eighteen anguli. Their ends should be shaped like the faces of the following ferocious beasts (1 to 8), deer (9), and birds (10 to 24), and the instruments are to be called after their names.¹ They are divided into two classes; the instruments of class I resemble the mouths of lion (simha) and tiger (vyāgra), while class II comprises the instruments which have the likeness of the faces of birds of prey. The fulcrums of these instruments which are at the middle, are of the size of a masūra (Ervum lens). The handles are either rounded off, or bent at an angle at their ends, like an elephant driver's goad—the object being to afford a good grasp of the instrument by the surgeon's hands. The svastika instruments are used for the extraction of

¹ तत्र स्वस्तिकप्रमाणाष्टदशाङ्गुलप्रमाणानि सिंहव्याघ्रवृकतरकुम्भचक्षीपिमाज्जरशृगालशृगै
व्याककाककङ्कुररचासभासशशवात्यलूकचिह्नियेनष्टप्रक्रौञ्चभृङ्गराजंअलिकर्णवभञ्जननन्दि-
मुखमुखानि मसूराकृतिभिः कौलेरववद्धानि मूलेऽङ्गुशवदाहचत्वारङ्गाण्यास्थिविनष्टशल्योद्धार-
णार्थमुपदिश्यन्ते ।

foreign bodies impacted in the bones.¹ If the foreign body is visible, extract it by the lion forceps or similar forceps of class I. If it is invisible, it should be extracted by the Heron forceps or similar forceps of class II. Of all the varieties of svastika instruments, the Heron forceps (kañka-mukha) is the best, for it can be easily introduced and turned in all directions, and also it grasps firmly and extracts a foreign body with ease and can be applied without any harm to all parts of the body.²

Class I:—

1. Simhamukha svastika or Lion-faced forceps:—this instrument is said to have its mouth shaped like that of a lion (Felis leo). It is the principle instrument of the class I. It is

¹ तुल्यानि कङ्कसिंहर्चकाकादिमृगपक्षिणां ।
मुखैर्मुखानि यन्त्राणां कुर्यात्तत् संज्ञकानि च ॥
अष्टादशाङ्गुलयामान्यायसानि च भूरिशः ।
मसूराकारपथ्यन्तेः कण्ठेवद्धानि कौलकैः ॥
विद्यात् स्वस्तिक यन्त्राणि मूलेऽङ्गुशनतानि च ।
ते दृढै रस्थिसंलग्नं शल्याहरणमिष्यते ॥

Aṣṭāṅga Hṛdaya. I. xxv.

² दृश्यं सिंहमुखाद्यैस्तु गूढं कङ्कसुखादिभिः ।
निर्हरेत्तु शनैः शल्यं शास्त्रयुक्तिव्यपेक्षया ॥
विवर्त्तते साध्ववगाहते च शल्यं निगृह्णीद्वरते च यच्चात् ।
यन्त्रेष्वतः कङ्कमुखं प्रधानं स्थानेषु सर्वेष्वधिकारि चैव ॥

Suśruta Saṁhitā I. vii.

निवर्त्तते साध्ववगाहते च
यास्त्रं गृह्णीत्वोद्धरते च यच्चात् ।
यन्त्रेष्वतः कङ्कमुखं प्रधानं
स्थानेषु सर्वेष्वधिकारि यच्च ॥

Aṣṭāṅga Hṛdaya. I. xxv.

curious that in modern times, the European surgeons use a pair of forceps called the Lion forceps for holding bones firmly during operations. So the Makaramukha of Pālakapya is the Crocodile forceps.

2. Vyāghramukha or Tiger forceps: the mouth of this instrument is like that of a tiger (*Tigris regalis*).

3. Vṛkamukha or Wolf forceps (*Canis lupus*).

4. Tarakṣumukha or Hyena forceps (*Hyena striata*).

5. Rkṣamukha or Bear forceps (*Ursus Americanas*).

6. Dwīpimukha or Panther forceps (*Felis pardus*).

7. Mārjāramukha or Cat forceps (*Felis domestica*).

8. Śrgālamukha or Jackal forceps (*Canis aureas*).

9. Airbbārūka or Deer forceps (*Cervus elephas*).

Class II:—The birds, in imitation of whose faces the instruments of this class are made, can be identified from the following description of their beaks:—

Birds: 1. Raptatories: they have curved beaks hooked at the extremity.

(a) Strigidæ...owls...strong hooked beaks bent down from base.

(b) Vulturidæ...vultures...long straight beaks bent down at tip.

(c) Accipetridæ...falcons, osprey and eagle...short, usually dentated beaks, hooked at the ends.

2. Pessaries...(a) Lanidæ...shrike...hooked and strongly serrated beak. (b) Cervidæ...crow and blue-jay...beaks strong, thick, somewhat curved anteriorly and slightly notched.

3. Gallatories...Heroidæ or Ardeidæ...herons and krauñca...they have long and powerful beaks with sharp hard

edges, somewhat curved at the point, rarely spoon-shaped, with long neck.

The instruments are—

10. Kākamukha or Crow forceps (*Corvus corone*).
11. Kaṅkamukha or Heron forceps (*Ardea cenerca*).
12. Kuraramukha or Osprey forceps (*Pandion haliaëtus*).
13. Cāsamukha or Blue-jay forceps (*Garrulous* or *Corvus cristatus*).
14. Bhāsamukha or Eagle forceps.
15. Śaśaghātīmukha or Hawk forceps (*Nanclerus furcatus*).
16. Ulūkamukha or Owl forceps (*Strix flammea*).
17. Cillimukha or Kite forceps (*Milivus ictinus*).
18. Śyenamukha or Vulture forceps (*Vulture cinereas*).
19. Gṛdhramukha or Falcon forceps (*Peregine falcon*).
20. Krauñcamukha (*Ardea jaculator*); or Curlew (*Numenius Arquatus*).
21. Bhr̥ṅgarājamukha or Fork-tailed or Butcher-bird forceps (*Lanius excubitor*).
22. Añjalikarṇamukha—birds not identified.
23. Avabhañjanamukha „ „ „
24. Nandinukhamukha (*Turdus Ginginianus*).

II. The Sandamśa or Pincher-like Forceps.

The second class of instruments—the Sandamśa¹ or pincher-like forceps—comprises only two instruments: the forceps with and without handles. The first variety is likened

¹ सनियद्दीनियद्दश सन्दंशौ षोडशाङ्गुली भवतस्त्वस्मसिसिरास्त्रायुगतशल्कीद्वारणार्थं-
मुपदिश्यते ।

to forceps with arms, used by the barbers for depilating the nasal cavities, while the second variety is like the armless forceps used by the goldsmiths. The former consists of two arms joined crosswise by a pin fixed at about their middle points, and so really is a cruciform instrument but is classed here for its different use in surgery. The forceps without handles consists of two blades soldered at one end. Some commentators like to subdivide the pinchers into two classes according as their ends are rough or smooth. And so Hessler translates :¹ “*Duae forcipes denticulata et non denticulata*”.

The sandamśas are used for the purpose of extracting foreign substances from the soft structures of the human body, such as the skin, muscles, veins, nerves, and tendons². Generally they have a length of sixteen aṅguli.

Vāgbhaṭa II mentions two other instruments as modifications of the type :—

(a) One variety has the length of six aṅguli. It is intended for the purpose of extracting minute foreign bodies such as thorn, hair &c. and of removing the superfluous eyelashes.³

Cakrapāṇi also advises us to use a sandamśa for epilation, which may be called the Epilation forceps.⁴

¹ Hessler's *Suśruta*. Caput vii. P. 14.

² कीलवच्च बियुक्तयौ सन्दर्शौ षोडशाङ्गुली ।
त्वकसिरास्त्रायुपिशित लग्न शल्यपकर्षणे ॥ ५ ॥

Aṣṭāṅga Hrdaya, I. xxv.

अतिगुप्तं शल्यं सन्दर्शनं समुद्धरेत् ।

Hārīta Saṁhitā, III. lvi.

³ षडङ्गुलीऽन्योद्धरणे सूक्ष्म शल्योपपक्वयोः ॥ ६ ॥

Aṣṭāṅga Hrdaya, I. xxv.

⁴ See foot-note 2, p. 66.

Similarly in modern times, we remove superfluous eyelashes by the Epilation forceps. Mr. Berry writes¹:—"When the trichiasis is only partial, a temporary improvement is obtained by epilation. In some cases where a few eyelashes only have been left altogether, the patient may procure for himself a pair of forceps, and have the eyelashes removed whenever they cause irritation." Surgical epilation was frequently necessary for trichiasis among the Romans and a similar forceps was in use there.²

In ancient times in India, the barbers used epilation forceps for pulling out grey hairs. In Makha-deva jāṭaka, we find the following conversations between the king and his barber³:—

"Barber. There is a grey hair to be seen on your head, O King."

King. Pull it out, then, friend, and put it in my hand.

So he tore it out with golden pinchers, and placed it in the hand of the King."

(b) The second variety is known as the Mucuṭṭi instrument.⁴ It is a pair of straight forceps, having no curve like that of the sandamśa. It is serrated finely at the open ends. The soldered end has a ring attached to it as ornamentation. It is recommended to be used for removing painful sloughs and proud granulations from a deep-seated abscess. It is also to be used to

¹ Practical Ophthalmology, 1904. By G. A. Berry, M.B. P. 52.

² Paulus Aegineta. VI. xiii. (Syd. Soc. Ed.)

³ Rhys David's Buddhistic jāṭaka stories, Vol. I, pp. 187.

⁴ मुचुट्टी सूक्ष्म दन्तर्जुमूलं रुचकभूषणा ।

गम्भीरं व्रणमांसार्चो चान्द्राणः शीघ्रतस्य च ॥ ७ ॥

complete the operation for pterygium by removing the remnant, after it has been extirpated by the sharp instruments. Suśruta calls it Mucundī¹, and uses it to hold the pterygium after it has been raised by vaḍīśa or hook. It must be then a smaller variety of mucuṭi.

A similar pair of forceps, Dr. Erichsen mentions, and says² that "for the purpose of extracting needles, thorns, splinters of wood and other foreign bodies of small size and pointed shape lying in narrow wounds, forceps with very fine but strong, well-serrated points will be found useful."

Suśruta mentions bairasabidala³ or bamboo forceps. It is made of a piece of bamboo rod, split longitudinally into two halves nearly to its whole extent. This is like the bamboo tongs used by the smokers in Bengal to raise glowing charcoal to the earthen bowl. It should be used to remove worms from the surface of the human body.

The sandaiśa instrument may be compared with the modern dressing forceps and with the forceps still used by the goldsmiths, known as a sonnā. Those with arms have their counterpart in the sādāśi or a pair of pinchers, still used by the blacksmiths.

III. Tāla Yantra or Picklock-like Instruments.

The third class of blunt instruments is called Tāla-

¹ अपाङ्गं प्रेक्षमाणस्य वङ्गिण समहितः ।
मुचुण्डाङ्गं च मेधावी सूचीसूत्रेण वा पुनः ॥

Suśruta Saṁhitā, vi. xv.

² Erichsen's Science and Art of Surgery, Tenth Ed. vol. I. p. 342.

³ ताननुतेलिनाभ्यक्तस्य वंशविदलेनापहरेत् ।

Suśruta Saṁhitā, IV. xxvii.

yantra¹. The word tāla "has been differently interpreted by the commentators. Bhānumatī gives the alternative reading (tālu i.e., palate) for tāla, so the instruments likely had their ends shaped like the palatine process of fish. Dallana,² however, maintains that tāla means picklock, the ordinary Indian key which resembles a hook. Two of these are joined at one end, the curved ends being kept free, facing one another. The instrument would then resemble the face of a bhetuli fish. Instruments with one tāla or hook resemble one lip of the fish, and those with two tālas represent its entire face. Both Cakrapāṇi and Dallana however prefer to mean by tāla, the scale of a fish."

They have a length of twelve aṅguli, and are shaped like the jaws of a fish. They may be made either with a single blade (ekatāla) or with double blades (dvitāla) soldered at one end, the hooked ends being free. They are intended for the purpose of extracting foreign bodies from the ear, nose and other outer canals of the body. The ear scoop now used by the barbers of India for extracting wax from the ear is a tālayantra.

¹ तालयन्त्रे द्वादशाङ्गुलि मत्स्यतालवदकतालद्वितालके कर्णनासानाडीशल्यानामा-
हरणार्थं ।

Suśruta Saṁhitā, I. vii.

वे द्वादशाङ्गुलि मत्स्यतालवद्देहक तालके ।

ताल यन्त्रं स्मृते कर्णनाडी शल्यापहारिणी ॥

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxv.

² 'अत्र ताल-शब्देन प्रदेश उच्यते । एतेन एकं तालं प्रदेशी यस्य तदेकतालं, द्वे ताले प्रदेशौ यस्य तत् द्वितालकम् ; एतेन मत्स्यस्य शल्कवत्प्रतनुमुखरप्रदेशं एकताल मत्स्यशल्कवत् प्रतनुमुखं द्विप्रदेशं द्वितालमित्युक्तम् । परिणाहस्तु कर्णादिप्रवेशी ज्ञेयः । अथे तु मत्स्यतालकवदकतालकद्वितालके इति पठन्ति । व्याख्यानयन्ति च मत्स्यस्य भेटुनिमत्स्यः, तस्य लौहमयतालकाकारं मुखं भवति अतस्तस्माद्विषाकारं यन्त्रमेकतालकं, सर्व्वमुखकारं द्वितालकं, तालकीऽत्रापवारकादिपाटसन्निवन्धनं लौहमयमुच्यते ।

Dallana's Commentary, I. vii.

For removing substances that have fallen into the meatus auditorius, Paul says:¹ "They must therefore be extracted by an earpick, a hook, or tweezers, or by using powerful shaking of the head, while the ear is placed upon some circular board." Albucasis recommends us to use a slender forceps, which resembles the modern dissecting forceps. He also commends for the purpose a hook slightly bent, which is also mentioned by Celsus.²

IV. The Nāḍi Yantra or Tubular Instruments.

The Nāḍi or tubular instruments are described to be of various kinds and to serve many purposes". They are open either at one or both ends. These are used for the extraction of foreign substances from the natural outlets of the body. They are also recommended to be used as a diagnostic apparatus for inspection of diseases in the canals. They are the means of sucking out fluid discharges, as pus *etc.*, from cavities and they facilitate the performances of other operations. They vary in length and diameter in proportion to the different sizes of the outer canals of the body, or according to the varieties of purposes to be served by them.

¹ Paulus Ægineta, Vol. II. VI. xxiv. (Syd. Soc. Ed.)

² Celsus, VI.

³ नाडी तन्वायनेकप्रकाराण्यनेक प्रयोजनान्येकतोमुखान्युभयतोमुखानि च तानि स्त्रीतो-
गतश्लेष्मोद्धारणार्थं रोगदर्शनार्थमाचूषणार्थं क्रियासीकाथ्यार्थाच्चेति तानि स्त्रीतदारपरिणाहानि
यथायोग परिणाहदीर्घाणि च ।

Suśruta Saṁhitā, I. vii.

नाडीयन्त्राणि शुषिराण्येकानेक मुखानि तु ।

स्त्रीतोगतानां श्लेष्मानामयानां च दर्शने ।

क्रियाणां सुकरलाय कूर्थादाचूषणाय च ।

तद्विस्तार परिणाह देव्यं स्त्रीतोऽनुरोधतः ॥ २ ॥

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxv,

The tubular instruments are used for fistula-in-ano, haemorrhoids, tumours, abscesses, injections into the rectum, vagina and urethra, hydrocele, ascites, inhalations, stricture of urethra and rectum and cupping as by gourd and horns.¹

As examples of the tubular instruments, Vāgbhaṭa II. mentions :—

1. KANṬHASALYĀVALOKINĪ² OR THROAT SPECULUM.

To examine foreign substances such as a fish-bone in the throat, the instrument should have a length of ten aṅguli and a circumference of five aṅguli.

Suśruta describes the extraction of a foreign body, made of lac from the throat of a patient by the following device. A heated iron probe or sound should be introduced into the throat of a patient through a tube of copper and made to touch the bit of shellac. The foreign substance would begin to dissolve or soften and so will adhere to the probe. The rod is then to be cooled by sprinkling water through the tube and the foreign body then should be drawn out steadily with it.³ But other kinds of foreign bodies are to be extracted from the throat by means of a rod-like instrument, one end of which is smeared with melted wax or shellac.

The use of some adhesive substance for extraction of foreign bodies accidentally introduced into the outer passages of the

¹ भगन्दराशोऽर्ज्वद्वन्नवस्तोत्तरवस्तिमूत्रवृद्धिदकोदरधूमनिरुद्धप्रकाशसन्निरुद्धगुदयन्त्राख-
लावृश्चयन्त्राणि चोपरिष्ठावह्यामः ।

Suśruta Samhitā, I. vii.

² दशङ्गुलार्धनाहान्म. कण्ठशल्यावलीकिनी ।

Aṣṭāṅga Hrdaya, I. xxv.

³ जातुषे कण्ठासक्ते कण्ठे नाडीं प्रवेष्ट्वाप्रितप्ताच्च शलाकां तथावगृह्य शीताभिरङ्गिः
परिषिच्य स्थिरौभूतमुद्धरेत् । अजातुषं जतुमधूच्छिष्टलिपया शलाकया पूर्वकण्ठेनेत्येके ।

Suśruta Samhitā, I. xxvii.

human body was well known to the Greeks and Romans. Paul says:¹ "Stones and such like bodies we extract by wrapping wool round an earpick, and smearing it with turpentine-rosin, or some glutinous substance, and introducing it gently into the meatus auditorius."

2. PAÑCAMUKHA AND TRIMUKHA.

To take a good hold of a four-eared arrow, a speculum having five holes (PAÑCAMUKHA) should be had recourse to; and for a two-eared arrow, a speculum having three holes (TRIMUKHA) would be necessary. The central hole is for the arrow, while the side holes are meant for the ears of the arrow.²

Celsus³ says that when a weapon buried in the flesh has barbs too strong to be broken with forceps, they may be shielded with split writing-reeds (*Calamus scriptorium*), and the weapon thus withdrawn.

Paul says: "Some apply a tube round about the barbs⁴ so that when they draw out the weapon, the flesh may not be torn by the barbs."

In modern times a snare is used instead of a tube. Dr. Erichsen⁵ writes: "The extraction of an arrow is usually attended with little difficulty. But if barbed, special precautions have to be taken. With the view of safely effecting its removal, the snares.....have been devised."

¹ Paulus Ægineta. Vol. II. VI. xxiv. (Syd. Soc. Ed.)

² नाडीपञ्चमुखच्छिद्रा चतुष्कर्णस्य संग्रहे ।

वारङ्गस्य द्विकर्णस्य त्रिच्छिद्रा तत् प्रमाणतः ।

Aṣṭāṅga Hṛdaya, I. xxv.

³ Celsus, vii. v.

⁴ The Works of Paulus Ægineta. vi. lxxxvii.

⁵ The Science and Art of Surgery. Vol. I. pp. 343.

3. TUBULAR INSTRUMENTS FOR INSPECTION OF ARROWS.

Again for the inspection of the arrows, various kinds of tubular instruments would be necessary, which will vary according to the shape, length, and circumference of the arrows and their ears.¹

4. ŚĀLYANIRGHĀTANĪ.

The top of this tubular instrument is shaped like the disc of a lotus and is closed. The other end is open and leads to a hollow extending to a fourth part of the tube. It has a length of twelve aṅguli. It is useful for removing an arrow fixed deeply into the body, in different directions and thus helping its easy extraction.² For this purpose Suśruta directs us to use a stone hammer.

The Śālyanirghātani had its counterpart in the female part of the Impellent, mentioned by Paul, for forcing an arrowhead forwards through a part so as to extract it at the side opposite to that of its entrance. It would thus be seen that the function of the Impellent was similar to that of the Śālyanirghātani; the former moved it forwards, while the latter moved the śālya side to side, the object of both being to extract the foreign substance. The Impellent would seem to have been a plain rod of metal pointed at one end (the male part) and hollowed at the other (the female part); the pointed end used to be introduced into the socket of an arrow when it possessed one, and the hollow

• ¹ वारङ्ग कर्णसंस्थान नाह दैर्घ्यातुरीधतः ।

• नाडीरेवं विधाशान्या द्रष्टुं शल्याणि कारयेत् ॥ १० ॥

Aṣṭāṅga Hṛdaya, I. xxv.

² पद्मकर्णिकया मूर्द्धि सट्टशी द्वादशाङ्गुला ।

चतुर्थं शुधिरानाडी शल्यनिर्घातनी मता ॥

end was meant to fit over the tail in case where the arrow was tanged.¹ The Greeks and Romans recognised the necessity of an arrow being moved about until loosened, if it remained fixed in the bone; and Celsus² directs us to strike it with some iron instrument until it be shaken from the place where it is lodged.

5. TUBULAR INSTRUMENTS FOR PILES.

According to Suśruta³ these should be made either of iron, or ivory, or horn or wood. They are hollow instruments tapering at the end which should be shaped like the teat of a cow. For males, the length is four aṅguli, while the circumference is five aṅguli. In the case of females, however, the tube should be made wider, the circumference being six aṅguli, and longer, the length being equal to the space covered by the palm of the hand. There are two slits on the sides—one for inspection of diseases and the other to allow application of caustic and cantery to the diseased part. The slit measures three aṅguli in length and the pulp of the thumb in breadth. At a distance of a half aṅguli from the margin of the slit, is raised a circular projection, also a half aṅguli high.

¹ Paulus Aegineta, VI. lxxxviii.

² Celsus, VII. 5.

³ तत्र यन्त्रं लौहं दान्तं शार्ङ्गं वार्धं वा गोस्नानाकारं चतुराङ्गुलायतं पञ्चाङ्गुलपरिणाहं पुंसां षड्ङ्गुलपरिणाहं नारीणां तलायतं तद्विच्छिद्रं दर्शनार्थमेकं छिद्रमेकं छिद्रन्तु कर्णैश्च । एकद्वारे हि शस्त्रचाराग्नीनामतिक्रमो न भवति । छिद्रप्रमाणन्तु द्वाङ्गुलायतमङ्गुलीद्वर-परिणाहं यदङ्गुलमवशिष्टं तस्याङ्गुलमधस्तादङ्गुलीच्छितोपरिवृत्तकर्णिकमेव यन्त्राकृति-समानः ।

Vāgbhaṭa¹ describes two different instruments, one for inspection and the other for medication. They both have the same length and circumference. The former has two slits on the side, while the latter has only one slit, three aṅguli long and the pulp of the thumb in width. The annular projection is turned upwards : the object being the prevention of sudden introduction of the instrument too far inwards.

A similar instrument without any slit on the side is called Śamī². It is advised to be used for exerting pressure over the piles by its introduction into the rectum (Vāgbhaṭa.)

Rectal speculum is mentioned by Hippocrates in his treatise on fistula³ and by Paul in the treatment of piles.⁴ It is called Calopter in contradistinction to the vaginal speculum which is called Diopter. The rectal speculum in the Naples museum is a two bladed instrument working with a hinge in the middle. In modern times, both the varieties of the speculum, tubular and valved, are in use.

For inspection and medication of piles, a tubular speculum is recommended to be used by the veterinary surgeons. In the

- ¹ अशसां गोक्षनाकारं यन्त्रकं चतुरङ्गुलम् ।
नाहे पञ्चाङ्गुलम् पुंसां प्रमदानां षडङ्गुलम् ।
द्विच्छिद्रं दर्शने व्याधेरिकच्छिद्रन्तु कर्मणि ।
मञ्जुस्य चाङ्गुलच्छिद्रमङ्गुलीदरं विसृतम् ।
• अङ्गुलीच्छिद्रं तद्वत् कर्णिकञ्च तद्रङ्गुलम् ॥

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxv.

- ² शय्याख्यां तादृगच्छिद्रं यन्त्रमशः प्रपीडनं ॥ १३ ॥

Ibid.

- ³ The Genuine Works of Hippocrates. (Syd. Soc. Ed.) Vol. II. P. 817.

- ⁴ Paulus Ægineta, VI. lxxix.

Aśvavaidyaka, Jayadatta sūri¹ describes the instrument thus: "The surgeon should know the instrument to have the length of six aṅguli. On the two sides, the wise surgeon should make two slits, three aṅguli long and a half aṅguli broad. Through an instrument with two slits, the piles of the horses should be examined. Through a speculum with one slit, the surgical operations, such as incisions &c., should be performed, after having tied the horse and making him lie down".

6. TUBULAR INSTRUMENTS FOR FISTULA-IN-ANO.

These are similar to the instruments used for the inspection and medication of piles, the only difference being the omission of the circular rings in their construction, for otherwise, the projection may rub over the sore if the speculum be introduced deeply.²

¹ यन्त्रं षडङ्गुलं विद्वान् छिद्रं पञ्चाङ्गुलं भिषक् ।

अधोऽर्द्धाङ्गुलाविलीर्णं दैव्येणाप्यङ्गुलतयम् ॥

उभयोः पार्श्वयोस्तस्य कुर्याच्छिद्रद्वयं बुधः ।

अर्शस्तेन तु वाह्नस्य द्विच्छिद्रेण विलोकयेत् ॥

एकच्छिद्रेण वै कर्म कुशोक्तेदादि पूर्वकम् ।

पातितस्य सुवह्नस्य तुरङ्गस्य विचक्षणः ॥

Aśvavaidyaka (Bibliotheca Indica). Liii. vs. 4, 5 and 6.

² क्षिद्रादूर्ध्वं हरीदीपमर्शयन्त्रस्य यन्त्रवित् ।

ततो भगन्दरे दद्यादेतदङ्गेन्दु सन्निभं ॥

Suśruta Saṁhitā, IV. viii.

सर्वथाऽपनयेदीष्टं क्षिद्रादूर्ध्वं भगन्दरे ।

Aṣṭāṅga Hṛdaya, I. xxv.

7. TUBULAR INSTRUMENTS FOR THE NOSE.

Nasal-Speculum.

Similar tubular instrument without ring is to be used for examination of nasal diseases as tumours and polypus. It is however shorter and thinner than the rectal speculum. Vāgbhaṭa says: "It is two aṅguli long and admits the index finger in its lumen. The tube has a single slit on the side."¹

He describes nasal tubes for introducing medicated powders into the nose as snuff.² After partially filling the tube with powders, one should blow through the empty end, the other end being put well inside the nasal cavity. Suśruta also uses a tube to blow powder into the nose.³ Caraka⁴ mentions nasal insufflation to cure diseases. Śārṅgadhara⁵ and Cakradatta⁶ describe the nasal tube for insufflation to be six aṅguli long and open at both ends.

¹ घ्राणार्थदार्शसामेकच्छिद्रा नाड्यङ्गुलद्वया ।

प्रदेशिनी परिणाहा स्याद्गन्धर यन्त्रवत् ॥ १५ ॥

Aṣṭāṅga Hṛdaya, I. xxv.

² 'आन' विरेचनशून्यो युञ्ज्यात् तं मुखवायुना ।

षडङ्गुलद्विमुखया नाड्या भेषजगर्भया ।

Ibid. I. xx.

³ नासास्त्रावे घ्राणतयूर्णमुक्तं नाड्यादियं योऽवपीडयतीक्ष्णः ।

Suśruta Saṁhitā, VI. xxiii.

⁴ सिद्धिं स्थापनावनं चूर्णैश्चेषां प्रथमणे हितं ।

Caraka Saṁhitā, VI. xxvi.

⁵ षडङ्गुला द्विवक्त्रा या नाडी चूर्णन्तयो धमेत् ।

तीक्ष्णं कीलमितम्बन् वातैः प्रथमनं हितं ॥

Śārṅgadhara Saṁgraha, III viii.

⁶ आपनं विरेचनशून्यो युञ्ज्यात् तत् मुखवायुना ।

षडङ्गुल द्विमुखया नाड्या भेषजगर्भया ॥

Cakradatta, Nasyadhikāra.

Aretacus says that a quill or reed or a wide long tube may be used for blowing powders into the pharynx. Alexander Trallianus² says that a calamus scriptorium, the joints of which have been removed, may be used as an insufflator. Oribasius³ however gives the fullest description of the tube used as a nasal insufflator. "A reed slender and with a straight bore, 6 inches in length, and of such a size that it can be passed in the nares, is taken and its cavity entirely filled with medicament. The reed may be either natural or of bronze. This being placed in the nares, we propel the medicament by blowing into the other end."

In modern times, we advise our patients to do the same thing when powders are prescribed to be thrown into the nose or ears. The cylindrical shaft of the ordinary quill so cut as to be open at both ends will serve the purpose admirably. The nasal insufflator is used now for identical object.

Aretacus⁴ mentions a nasal syringe with a double tube. It consists of two pipes united together by an outlet so that liquid medicine may be injected into both the nasal cavities simultaneously, for injection into each nostril separately, he points out, can not be borne.

It is remarkable that in Mahāvāgga⁵ mention is made of single and double nose-spoons. Nāthu-karaṇi (*i.e.*, an instrument to hold up the nose, so that the medicated oil

¹ Aretacus, Vol. II., P. 408.

² Alexander Trallianus, IV. viii.

³ Oribasius Collect, xii.

⁴ Aretacus, Ed. Adams, Vol. II., P. 459.

⁵ Mahāvāgga, VI. 13. 1 & 2. Sacred Books of the East,

does not run out...Ed.) and Yamaka-nāthu-karaṇi (*i.e.*, one that would go up both nostrils...Ed.). They are recommended to be made of gold, or silver, or bone, or ivory, or horn, or of the *nala* reed, or of bambu, or of wood, or of lac, or of the shells of fruit, or of chank-shell". (Sacred Books of the East).

To apply oily medicines inside the nasal cavity a cotton wick is first soaked in the oil and then it is pushed well inside the nose. It is recommended also to pour oil into the cavity through a tube, while the other cavity is pressed by a finger (Vāgbhaṭa¹).

To treat a case of fracture of the nasal bones, Suśruta recommends² two straight tubes open at both ends to be introduced into the nasal cavities, after putting the fractured ends in position, either lowering or elevating the raised or depressed end by a rod as required. Then bandages are to be applied. The tubes serve as splints to support the broken ends in position, while through their orifices the patient may breathe without inconvenience.

Similarly Celsus, after replacing the fractured ends in position uses oblong tents sewed round with a thin soft skin as splints into the nostrils; or a large quill smeared with gum, or artificer's glue may be applied in the same way. Paul also

¹ नासापुटं पिपायेकं पथ्यायेण निषेचयेत् ।

उष्णास्तु भेषज्यं प्रनाद्या पितुनाऽथवा ॥

Aṣṭāṅga Hṛdaya, I. xx.

² नासां सर्गां विहृतां वा ऋज्वीं कृत्वा शलाकया ।

पृथग् नासिकयोनाभौ द्विमुखौ संप्रवेशयेत् ॥

ततः पङ्केन संवेष्ट्य घृतसेकं प्रदापयेत् ॥

Suśruta Saṁhitā, VI. iii.

says: "And some sew the quills of the feathers of a goose into the rags, and thus introduce them into the nose, in order that they may preserve the parts in position without obstructing the respiration; but this is unnecessary as respiration is carried on by the mouth."¹

Suśruta also advises us to introduce these tubes into the nasal cavities during the performance of the Rhinoplastic operations.²

8. THE AṅGULI-TRĀṆAKA OR FINGER-GUARD.

Vāgbhaṭa says:³ "It is generally made either of ivory or wood. The instrument is shaped like the teat of a cow, and is four aṅguli long. Two slits occur on the sides like those in the speculum for piles."

It protects the finger of the surgeon from being injured by the teeth of the patient and so helps the surgeon in opening the mouth of the patient with ease.⁴

In modern times, finger-guards are used for the same purposes.

¹ Paulus Ægineta, Vol. II. vi, xci. Syd. Soc. Ed.

² सुसंहितं सम्यगधी न्यावन्नाङ्गीदयेनाभिसमीक्ष्य वद्धा ।

प्रोन्नत्य चेनामवचूर्णयेच्च पक्षङ्गयष्टीमधुकाञ्चनेन ॥

Suśruta Samhita, I. xvi.

³ अङ्गुलिपाणकं दान्तं वार्धं वा चतुरङ्गुलम् ।

द्विच्छिद्रं गीसनाकारं तद्वक्त्रविहतौमुखं ॥

Aṣṭāṅga Hṛdaya, I. xxv.

⁴ तच्च वक्त्रं विहतौ, सम्भृतं मुखस्यातुरस्य मुखव्यादानं निमित्तं रुग्णं सुखकरं स्यात् ।
यत इदं दन्तघातात् रक्षति अत उक्तं सुखमिति ।

Vāgbhaṭārtha Kaumudi, I. xxv.

अङ्गुलिदन्तेभ्यो रक्षणाधत्वां दङ्गुलिपाणमिति नाम ।

Sarvāṅga Sundarī, I. xxv.

9. JONĪ-VRAṆEKṢAṆA OR VAGINAL SPECULUM.

Vāgbhaṭa¹ describes it to be a tubular instrument, sixteen aṅguli long, and six aṅguli in circumference. It consists of four blades, attached at their bases to a ring. The tube tapers gradually, the end is free and looks like the bud of a lotus. To the four blades are soldered four rods in such a way that on pressing their free ends, which pass out of the ring, by the surgeon's hands, the tapering end of the tube would gape widely. The surgeon by regulating the pressure of his hand, may open or close the speculum to any desired extent.

Another kind of vaginal speculum used to be manufactured out of the two horns of a buffalo by dividing each into two longitudinal halves. They should be so paired that their concave surfaces would look towards one another, their ends diverging outwards. So we get a pair of bivalve speculum out of a pair of horns.

The bivalve speculum of horn mentioned above, has its modern counterpart in the pair of speculum known as Barne's or Neugebauer's speculum.

- ¹ योनिन्नखेक्षणं मध्ये शुषिरं षोडशाङ्गुलम् ।
मुद्रावद्धं चतुर्भिस्तमन्त्रोज मुकुलाननं ।
चतुःशलाकामाक्रान्तं मूले तद्विकसेन्दुखे ॥ १७ ।

Aṣṭāṅga Hṛdaya, I. xxv.

अस्य यन्त्रस्य कल्पनायां चत्वारिखण्डानि तथा कार्याणि यथा मुद्रिकया वृद्धानि मिलितानि च पद्ममुकुलाकार मुखा, अन्तर शुषिरा षडङ्गुल परिणाडवती नाडी स्यात् । ततस्तन्मध्ये प्रत्येकं खण्डसंलग्नं चतस्रः शलाकाः आमुखात् सन्निवेश्य शलाकानामध्यभागे तथा वन्नीयात् यथा शलाकामूल पीडनेन यन्त्रस्य मुखं विकसेत् ।

Vāgbhaṭārtha Kaumudī, I. xxv.

The vaginal speculum or Diopter is mentioned by Soranus, Paul¹ and other Greek surgeons. Paul describes its method of working as follows:— "The person using the speculum should measure with a probe the depth of the woman's vagina, lest the stalk (fistula) of the speculum being too long, it should happen that the uterus should be pressed upon. If it be ascertained that the stalk is larger than the vagina, folded compresses are to be laid on the *alæ pudendi*, in order that the speculum may be placed upon them. The stalk is to be introduced, having a screw at the upper part, and the speculum is to be held by the operator, but the screw is to be turned by the assistant, so that the *laminæ* of the stalk being separated, the vagina may be distended." The accounts given by Albucasis² and Haly Abbas³ are similar. These instruments are described to be bivalve, trivalve or quadrivalve. A quadrivalve speculum of the Greeks is identical with the *Joni-vraṇekṣaṇa* of the Hindus; the only difference being that the former is acted by screw mechanism, while the latter is worked on the principle of the lever. Drawings of several shorts of the Greek instruments are given in the surgery of Albucasis and by Schultet.⁴ There are three specimens of vaginal, speculum in the Naples museum, drawings of which are given by Milne. In modern times, we use similar valvular speculum for identical purposes.

¹ Paulus Ægineta, Vol. II. vi. lxxiii. Syd. Soc. Ed.

² Albucasis, *Chirurg.* II. 71.

³ Haly Abbas, *Pract.* ix. 57.

⁴ *Arsenal de chirurg.* tab. 18.

10. TUBULAR INSTRUMENTS FOR WOUNDS.

Vraṇa-vasti or Wound-syringe.

If the wound be caused by deranged air and be very tender, especially if it forms on the lower half of the body, the vasti should be used. In diseases of the urinary organs, such as, obstruction of urine, faulty conditions of urine, impure semen, stone in the bladder and disorders of menstruation, uttara-vasti is necessary.¹

There are two instruments mentioned—one for application of oleaginous medicines to a sore and the other for washing a sinus with medicated lotions. Each consists of a tube and a leather bag. The tube is smooth and rounded and is shaped like a cow's tail.² It is six aṅguli long. The base is broad and admits a thumb, while the end is narrow and admits a pea. There is a circular projection or ring at a short distance from the end. The base is fitted tightly into a bag of thin leather.³

¹ वातदुष्टो व्रणायस्तु कृचायत्यर्थवेदनः ।
अधःकायं विशिष्टेण तत्र वस्तिव्विधीयते ।
मूत्राघाते मूत्रदोषे युक्तदोषेऽस्मरीव्रणे ।
तथैवार्त्तवदोषे च वस्तिरप्युत्तरो हितः ॥

Suśruta Saṁhitā. IV. i.

² नाडी व्रणानां स्नेहप्रयोगार्थं प्रचालनार्थञ्च द्वे यन्त्रे आह यन्त्रे इत्यादि नाडीव्रणाभ्यङ्ग-
चालनाय नाडीव्रणानामभ्यङ्गार्थं प्रचालनार्थञ्च षडङ्गुलं षडङ्गुलं दीर्घं, वस्तियन्त्राकृति वस्ति-
नेवाकारे व्रणे गोपुच्छाकारे * * * *

Vāgbhaṭṭārtha Kaumudī. I. xxv.

³ यन्त्रे नाडी व्रणाभ्यङ्ग चालनाय षडङ्गुलि ।
वस्तियन्त्राकृती मूलऽङ्गुष्ठ कलायस्त्रि ।
अगतः कर्मिके मूलं निवृत्तदुच्चर्मणी ॥ १८ ।

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxv

To prevent the tube slipping out of the bag, an additional precaution is taken by tying a knot of thread over the leather covering the tube. For description of the bag, *vide infra*.

Śārṅgadharma¹ however says that the tube should have the thickness of the shaft of a vulture's feather and should admit a moong (Phaseolus Moong). It is eight aṅguli long.

Pālakāpya describes the tube for washing wounds of elephants to be made of copper, and shaped like the karontaka flower. It is sixteen aṅguli long.

In modern times, wound syringes are similarly used to wash the sore with medicated lotions.

For description of the tubes for vṛaṇa-dhupana or wound-fumigation, *vide infra*.

11. TUBULAR INSTRUMENTS FOR ASCITES.

Dākodara yantra or Canula.

It may be either metallic or manufactured from the cylindrical hollow calamus of a peacock's feather.² The tube is open at both ends and is of the same calibre throughout. Suśruta advises us to use a pipe of tin, or lead or a feather to drain the fluid, after the abdomen has been tapped.³

¹ व्रणवन्धस्तु नेत्रं स्यात् शल्लामष्टाङ्गुलीगमितम् ।

मुद्रच्छिद्रश्लेषपचनलिकापरिणाहि च ।

Śārṅgadharma Saṁgraha, III. vi.

² द्विद्वारा नलिका पिच्छनलिका वा दाकोदरे । १६ ।

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxv.

³ तत्र वृषादीनामन्यतमस्य नाडीद्विद्वारां पचननाडीं वा संयोज्या दोषोदक-
भवसिञ्चेत्ततो नाडीमपहृत्य तैललवणेनाभज्य व्रणवन्धेनोपचरेत् ।

Suśruta Saṁhitā, IV. xiv

Celsus describes a lead or copper canula for draining ascites.¹ Paul writes that the tip used to be bevelled off like a writing pen.² It was also employed in empyema.³ Albucasis⁴ mentions a tube of silver or copper or brass having a small hole at the bottom and three on its sides.

In modern times we use a metallic canula of similar shape for draining fluid in ascites.

12. TUBULAR INSTRUMENTS FOR HYDROCELE.

This is practically the same instrument described above. Suśruta⁵ mentions a tube or canula to drain the fluid after tapping the hydrocele with the vṛihimukha śastra or trocar. The Greek surgeons did not describe the operation. They preferred the open incision to puncture.⁶ Rhases, however, describes the operation of puncturing the scrotum for hydrocele.⁷

13. TUBULAR INSTRUMENTS FOR URETHRAL STRICTURE.

Suśruta recommends gradual mechanical dilatation of the urethra by means of tubes made of iron, or wood, or lac, well-smear-

¹ Celsus, vii. 15 & ii. 10.

² Paulus Ægineta, Vol. II. VI. L. Syd. Soc. Ed.

³ Hippocrates, ii. 259.

⁴ Albucasis, Chirrug, ii. 54.

⁵ मूत्रज्ञां स्वेदयित्वा तु वस्त्रपट्टेन वेष्टयेत् ॥

सेवन्त्याः पार्श्वतोऽधस्ताद्विध्यैर्द्वौ हि सुखिनः च ।

अथातः द्विसुखां नाडीं दत्त्वा विस्त्रावयेद्भिषक् ॥

Suśruta Saṁhitā, IV. xix.

⁶ Paulus Ægineta, VI. lxii.

⁷ Rhases, Cont. xxiv.

with ghee.¹ He advises us to use the same tube for three consecutive days, then another of larger calibre for three days more, and so on, till the canal be fully dilated. He reserves External Urethrotomy as a last resource.²

14. TUBULAR INSTRUMENTS FOR RECTAL STRICTURE.

Suśruta similarly describes gradual dilatation of stricture of the rectum, using a higher number of dilators after the lapse of three days until the desired effect is attained.³

¹ (a) निरुद्धप्रकाशे नाडीं लौहीसुभयतोमुखीं ॥

दारवी वा जतुकतां घृताभ्यक्तां प्रवेशयेत् ।

परिषेक वसामञ्ज शिथुमारवराहयोः ॥

चक्रतैलं तथायोज्यं वातघ्नप्रत्यसंयुतं ।

वग्राह्याह्रात् स्थूलतरां सम्यङ्नाडीं प्रवेशयेत् ॥

श्रोतोविवर्धयेद्वं स्निग्धमग्नञ्च भोजयेत् ।

भिलावा सेवनीं मुक्तां सद्यःक्षतवदाचरेत् ॥

Suśruta Samhitā, IV. xx.

(b) निरुद्ध प्रकाशे नाडीं हिमुखीम् कनकादिजम् ।

क्षिप्राभक्ता चुम्बुकादिस्नेहेन परिषेचयेत् ।

तैलीन वा वचदारुकान्कैः सिञ्जेन च वग्राह्यात् ॥

पुनः स्थूलतरा नाडीर्दया श्रोतोविवर्धयेत् ।

... ..

... .. रुद्धगर्दप्येष क्रियाक्रमः ॥

Cakradatta, Kṣudraroga Cikitsā.

See also Yogaratnākara, P. 368, where these verses are quoted.

² See I (a). अन्वयः—सेवनीं त्यक्त्वा शस्त्रेण वा सूत्रश्रोतः संकोचकारणं चर्मं विदारयेत् । तस्यापि द्वारस्याविपाटे मणिहारमप्येवं दारयेदिति ।

Commentary of Śrī Kaṇṭha in Vyākhyā Kusumāvalī
(Anandāśram Series), P. 406.

³ सन्निरुद्ध गृदे योज्या निरुद्धप्रकाशक्रिया ॥

Suśruta Samhitā, IV. xx.

There is no mention of solid bladder sounds in the Sanskrit medical books. But from the above descriptions, it seems beyond doubt that they had a set of dilators for stricture of the urethra and another set of dilators for stricture of the rectum. These dilators were tubes—either metallic or wooden—and had a regular gradation in the increase of their diameters. Cakrapāṇī mentions stricture dilators of gold.¹

In modern times we have also two sets of these instruments—urethral and rectal dilators, numbered in an ascending series according to the increased diameters of these instruments.

15. TUBULAR INSTRUMENTS FOR INJECTIONS INTO THE RECTUM.

Vasti yantra or Rectal Clyster.

Injections into the rectum are to be thrown by means of a tube with a membranous bag tied to its end. The tube is advised to be made either of gold, or silver, or lead, or copper, or brass, or bell-metal, or ivory, or horns, or glass, or precious stones, or wood or bamboo. It should be clean, smooth, strong, and tapering like a cow's tail, and should terminate in a smooth rounded bulb. The tube varies in length and circumference according to the age of the patient as follows:—

I. Caraka.²

Age.	Length of tube.	Opening at the end admits.
6 years ...	6 anguli ...	A moong
12 " ...	8 " ...	A pea
20 " and over ...	12 " ...	A small plum seed

¹ See foot note I (b), Page 124.

² सुवर्णरुप्यत्रपुतामरीति

कांस्थायसास्थिद्रुमवेणुदन्तैः ।

नलेर्विषाणैर्मणिभित्तं तैलैः

कार्याणि नेत्राणि मुकर्णिकानि ॥

II. Suśruta.¹

Age.	Length of tube.	Part of tube in bag.	Circumference of tube.	Circumference at end.	Measure of injection.
1 year	6 aṅguli	1½ aṅguli	Little finger	Shaft of heron's feather.	2 aṅjali
8 "	8 "	2 "	4th "	Shaft of falcon's feather.	4 "
16 "	16 "	3½ "	3rd "	Shaft of peacock's feather.	8 "
50 "	12 "	3 "	Pulp of thumb	Admits a plum stone.	12 "
70 "	Same as that of the 16th year.				

षड्द्वादशाष्टाङ्गुलं सन्धितानि षड्विंशतिद्वादशवर्षजानाम् ।

स्युर्मृद्गकर्कस्यु सतीनवाहिकिच्छिद्राणि वर्त्यापिहितानि चापि ॥

यथावयोऽङ्गुष्ठं कनिष्ठकाभ्यां मूलाग्रयोः स्युः परिणाहवन्ति ।

ऋजुनि गोपच्छसमाकृततीनिःश्रुत्तानि च स्युर्गुडिकामुखानि ॥

स्यात् कर्णिकैकाग्र चतुर्थभागे मूलाग्रिने वस्ति निवन्धने हे ।

जाग्रद्वोमाह्विषहारिणो वा स्याच्छौकरो वस्तिरजस्य वापि ॥

दृढमनुर्नष्टशिरो विगन्धः कषाथरक्तः मृष्टदुः सुगुडः ।

वृणां वयोवीचा यथानरूपं नेवेधु योज्यस्तु सुवद्वत्तुः ॥

Caraka Saṁhitā, VIII. iii.

Also quoted in Cakradatta, Anuvaṣaṇādhikāra.

¹ तत् सांवत्सरिकाष्टद्विष्ट वर्षाणां षडष्टदशाङ्गुलं प्रमाणानि कनिष्ठिकानामिका मध्यमाङ्गुलिं परिणाहान्यग्रेऽध्यर्द्धाङ्गुलाई तृतीयाङ्गुलं मन्निविष्टं कर्णिकानि कङ्कश्येन वर्हिपच नाडीतुल्यं प्रवेशानि मृदमाषकलाग्रमात्रं स्रोतांसि विदध्यान्ने चाणि तेषु त्वास्थापनाद्रव्यं प्रमाणमातुरहस्तमस्मिन्नेन प्रसृतेन सन्धितौ प्रसृतौ द्वौचत्वारोऽष्टौ विधेयाः ।

भवति चात्र ।

वर्षोत्तरिषु नेवाणां वस्तिमानस्य चैव हि ।

वयोवलशरीराणि समीचा वर्द्धयद्भिधिं ॥

पञ्चविंशतेरुद्धं द्वादशाङ्गुलं मूले ङ्गुष्टोदरं परिणाहमये कनिष्ठिकोदरं परिणाहमये त्राङ्गुलं मन्निविष्टं कर्णिकं गृध्रपचनाडीतुल्यं प्रवेगं कोलास्थिमात्रं च्छिद्रं क्लिप्तकलाग्रमात्रं च्छिद्रमित्येकं । सर्जानिमूले वस्तिनिवन्धनार्थं द्विकर्णिकानि । आस्थापनं द्रव्यं प्रमाणं तु विहितं द्वादशं प्रसृताः । मन्नेनैतुर्द्धं नेव प्रमाणमेतदेवद्रव्यं प्रमाणान्तु द्विरष्टवर्षवत् ।

तत् नेवाणि सुवर्णं रजतास्योरीति दन्तगृध्रमणितरुसारमणानि श्रुत्तानि दृढानि गोपच्छाकृतौश्रुत्तानि गटिका मुखानि । वस्त्रयात्रांश्चद्वानां सुदो नाति वहन्ता दृढाः प्रमाणवन्तो गोमह्विवराहजोरभाणां ।

III. Vāgbhaṭa II.¹

Age. (years).	Length of tube.	Opening at base admits.	Opening at end admits.
Under 1	5 aṅguli	1 finger	A moong (phaseolus moong).
1 to 6	6 „	1½ „	A masha (phaseolous Rox).
7 to 11	8 „	2 „	A kulāya (pea) (pinus sativum).
12 to 15	9 „	2½ „	Boiled pea.
16 to 20	12 „	3 „	A śṅgalakoli (zizyphis cenoplia).
over 20	varies according to the age, strength and size of the patient; but the orifice at the base of the tube need not be wider.		

नेवलाभि हितनाडी नलवंशास्थि सम्भवा ।

वस्त्रालाभि हितं चर्मं सूक्ष्मं वा तान्त्रं घनम् ॥

वस्तिं निरूपदिम्वन्तु यज्ञं मपरिमाजितं ।

सृङ्गुद्धत हीनञ्च मुहुःस्नेहविमर्हितं ।

नेवमूले प्रतिष्ठाप्य न्युञ्जन्तु विवृताननम् ॥

Suśruta Saṁhitā, IV. xxxv.

¹ तथोक्तु नेवं हेमादि धातु दास्वऽस्थि वेनुजं ।

गोपुच्छाकारमच्छिद्रं श्लक्ष्णं गुडिका मुखं ॥

ऊनेऽन्दे पञ्चपूर्णैः स्निग्धानसतभ्योऽङ्गुलानि षट् ।

सप्तमे सप्त तान्यष्टौ द्वादशे षोडशं नव ।

द्वादशैव परं विंशद् बीज्य वर्षान्तरेषु च ।

वयो बल शरीराणि प्रमाणमभिवद्ध्यते ॥

साङ्गुटेन समंमूले स्थौल्येनायि कनिष्ठया ॥

पूर्णोऽन्देऽङ्गुल मादाय तदङ्गुलिं प्रवर्द्धितं ।

चाङ्गुलं परमं छिद्रं मूलेऽयि वहने तु यत् ।

सुदृढं माषं कलायन्तु खिन्नं कर्कशुक्तं क्रमात् ॥

मूलं छिद्रं प्रमाणेन प्रान्ते घटितं कर्णिकं ।

वर्त्याय पिहितं मूलं यथास्वं द्वाङ्गुलान्तरं ।

कर्णिका द्वितयं नेत्रे कुर्त्यात् तत्र च योजयेत् ॥

अजावि महिषादीनां वस्तिं सुसुदितं दृढं ।

कषाय रक्तं निच्छिद्रं यन्मि गन्ध शिरं तनुं ।

यद्यितं साधुस्त्रेण सुखं संस्थाप्य भेषजं ।

बलाभावेऽङ्गुपादं वा न्यसेद्वासोऽथवा घनं ॥

Aṣṭāṅga Hṛdaya Saṁhitā, I. xix.

Cakradatta¹, Śārṅgadhara and Bhāva Miśra² follow Caraka as regards measurement. Kharanāda³ also gives a similar description.

¹ See foot note 2, Page 125.

² नेतृं कार्यं सुवर्णादिधातुभिर्वचनेभिः ।
 नलैर्हृत्तैर्विषाण्यैर्मणिभिर्व्या विधीयते ॥
 एकवर्षात् षड्वर्षं यावन्मानं षडङ्गुलम् ।
 ततो द्वादशकं यावन्मानं स्यादष्टसंमितम् ॥
 ततः परं द्वादशभिरङ्गुलैर्नैव दीर्घता ।
 सुद्राक्षिद्रं कलायाभं क्षिद्रं कोलास्थिसन्निभम् ॥
 गोपुच्छसन्निभं मूलं स्थूलं तस्मात् क्रमात् कृशं ।
 यथासंख्यं भवेन्नैव शृङ्गं गोपुच्छसन्निभम् ॥
 आतुराङ्गुष्ठमानेन मूलं स्थूलं विधीयते ।
 कनीष्ठिकापरीणाहमये च गुटिका मुखे ॥
 तन्मूलं कर्णिके द्वे च कार्यं भागाच्चतुर्थकात् ।
 योजयेत् तव वस्तिञ्च वन्धयविधानतः ॥
 मृगजयकरगवां महिषस्यापि वा भवेत् ।
 भ्रुकोशस्य वस्तिस्तु तदन्तर्भागे च चर्मणः ॥
 कषायरक्तः सुभटवस्तिः स्निग्धो दृढोहितः ।
 व्रणवस्तिस्तु नैव स्यात् शृङ्गमष्टाङ्गुलीन्मितम् ॥
 सुद्रक्षिद्रगृध्रपक्षनलिकापरिणाहि च ।

Śārṅgadhara Saṅgraha, III, v.
 Bhāva Prakāśa, I, ii.

³ वस्तिनेवमृजु शुक्लं सङ्घट्टुलिकामुखम् ।
 भवेद्गोपुच्छसंस्थानं सुप्रवाहं विकर्णिकम् ।
 या विभागप्रणयने मर्यादा कर्णिका भवेत् ।
 द्वे कर्णिके चोपगृष्टादस्ताधारीऽयवान्तरे ।
 साङ्गुष्ठकपरीणाहं मूलं नेतृस्य शक्यते ।
 मध्यं त्वनामिकातुल्यमथं तुल्यकनिष्ठिकं ।
 स्वे नाङ्गुलि प्रमाणेन दीर्घं स्याद् द्वादशाङ्गुलम् ।
 कर्कशप्रवहच्छिद्रं श्रेष्ठमन्यदाथावयः ।

Hārīta¹ advises us to use a bamboo tube four aṅguli long, which is to be introduced into the rectum up to two aṅguli.

As a general rule, Caraka writes that the broad and the narrow ends of the tube are to be equal to the patient's thumb and little finger respectively, in circumference. The orifice at the end of the tube is to be kept closed by a wick, so that no foreign body may enter the lumen of the tube to occlude it. The plug may be easily removed when the tube is required for use, and then replaced.

Towards the narrow end of the tube is a projection or ring at a distance of about two aṅguli from the extremity. The height of the projection varies with the size of the tube at the base. It acts as a bar to the further introduction of the tube inside the rectum than required. Towards the base are two similar projections, two aṅguli apart from each other. To the one near the base is firmly tied the leather bag, so that the tube may not slip away suddenly during forcible compression of the bag. The other is meant to afford a firm grasp by the surgeon, so that the tube may not move during its introduction into the rectum. These projections are to be made of thread or a piece of cloth and are to be so shaped as to resemble the end of the proboscis of an elephant.

As regards the leather bags, they are recommended to be

विंशद्वादशषड्वर्षे द्वादशाष्टषडङ्गुलम् ।

कर्कश्वृक सतीनायमुखं विद्रवहम् ॥

Kharapāda quoted in Sarvāṅga Sundarī, I. xix.

¹ चतुरङ्गुलां त्रैलोक्ये नाडीं प्रतिलक्षणं कृत्वा त्वया वसिप्रतिकर्म्मं कुर्यात् । * * *

गुदाभ्यन्तरे द्वाङ्गुलमात्रं नाडी सञ्चारयेत् सुधीः ।

Hārīta Samhitā, V. iii.

made of the bladder of cows, or buffaloes, or hogs, or goats, or lambs. The bladder is to be well cleaned first with lime and water, so that no unpleasant smell may be emitted by the decomposition of its muscular tissue, then dyed red with Mañjiṣṭhā (*Rubia Cordifoliatum*) or with Harītakī (*Terminalia Chebula*, Retz.) and thoroughly dried. The bags are recommended to be soft, durable, entire and capacious. If the bladders of these animals are not available, the bags are to be manufactured from a frog's skin, or the peritoneum (one-fourth part would suffice) of any beast, or a piece of leather or a piece of very thick cloth. The size of the bag varies according to the age of the patient. It is to be firmly tied over the first projection at the base of the tube.

In the Siddhiṣṭhāna Chapter XI of the Caraka Saṁhitā,¹ there is a passage showing that veterinary medicine was well-known to the ancient Hindus at a very early period. This portion was edited by Dr. Bhavala and it is impossible to decide whether the passage refers to Agniveśatantra or not. It runs as follows:—
 “Then the disciples asked: ‘How are clysters to be made in cases of animals such as elephants, camels, cows, horses, lambs and goats?’ To this, the sage Ātreya explained the clysters for

¹ अष्टच्छेदनं सचवस्त्रिमव्रीत् विधिक्षतस्याह पुनः प्रचोदितः ।

अजाविकेसौम्य गजोदयोर्वा गवाश्वयोर्वस्त्रिमुशान्तिमाहिषम् ॥

अजाविकादन्तमुवस्त्रिमुत्तरं वदन्ति वस्त्रिं विपरीतरूपम् ।

मुवस्त्रिमष्टादशशोऽष्टाङ्गुलं तथैवनेव च दशाङ्गुलं क्रमात् ॥

गजोद्वगोऽश्वजवस्त्रि सन्धी चतुर्थभागे च सकर्षिकं वदेत् ।

प्रस्थस्त्वजाश्वोर्हि निरुहमात्रा गवादिष्व द्वित्रिगुणो यथा बलम् ।

निरुह उद्वग तथादकद्वयं गजस्य द्वित्रिस्तनुवासनेऽष्टमः ॥

animals in the following manner. The leather bag of the vasti-yantra should be made of a buffalo's bladder for goats, lambs, elephants, cows, camels and horses. The vasti for these animals is known as suvasti and uttara-vasti as uttara-suvasti. The tube of the suvasti should be eighteen aṅguli long for elephants and camels, sixteen aṅguli for cows and horses, and ten aṅguli for goats and lambs. Like the vasti yantra used for men, it should have a projection at the junction (of the tube with the bladder) and another at the fourth division of the tube from the end."

In the Aśvavaidyaka¹ the tube for the horse is thus described : "The tube should be made either of wood, or metals, or horn, or bamboo, or reeds. Its length should be twelve aṅguli and circumference six aṅguli. The wise surgeon should make the tube of such a calibre as to allow a plum seed to pass through it easily. It should be straight, polished and tapering from the base. At a distance of four aṅguli from the end of the tube, a projection should be raised, while for tying the leather bag firmly to the tube, two projections ought to be constructed at the base".

Pālakāpya² describes the rectal clysters for elephants. He advises that these are to be made either of wood or bamboo. The end is bulbous and the surface smooth. The length

¹ काष्ठैर्दण्डैर्योभिश्च शृङ्गवृश्नलादिभिः ।

द्वादशाङ्गुलीर्दीर्घन्तु परिष्णाद्दे षडङ्गुलम् ॥

कीलास्थिमातृच्छिद्रन्तु कुथ्यन्निर्व्वं विचक्षणः ।

मूलादनुक्रमं शृङ्गमसृणन्तु विशेषतः ॥

त्यक्त्वाङ्गुलानि चत्वारि कर्षिकान्तस्य कारयेत् ।

पुटकस्यप्रवन्धाय मूले द्वे चापि कर्षिके ॥

Aśvavaidyaka, XVI. vs. 2—4.

² Pālakāpya's Hasti-Āyurveda, Sec. IV. Ch. V.

length of the tube varies, the most convenient being sixteen aṅguli for men and sixty-eight aṅguli for elephants. The projections at the base of the tube should be twelve aṅguli high. He describes in detail the method of introduction, position of the elephant, etc.

Dṛḍhavalā advises us to reject the following eight kinds of tubes and eight kinds of bags¹ :—

I. Tubes—

1. Hrasva or too short : For the injection does not reach the proper place.
2. Dīrgha or too long : For the injection passes beyond the proper place.
3. Tanu or too thin : The injection can not pass through the tube easily and so the bag may burst.
4. Sthūla or too thick : The tube pulls the mucous membrane of the rectum and anus backwards and forwards during its entrance and exit.
5. Jīrṇa or old, weak and delicate : The tube may break inside the rectum during its introduction and so cause injury to the gut or anus.

¹ 'ह्रस्व' दीर्घं तनूस्थूलं जीर्णं शिथिलवन्धनम् ।
 पार्श्वच्छिद्रं तथा वक्रमष्टौ नेत्राणि वर्जयेत् ॥
 अप्राप्तातिगतिचोभकषेणचक्षणस्रवाः ।
 गुदपीडा गतिजिह्वा तेषां दोषा यथाक्रमम् ॥
 मांसलच्छिद्रविषमस्थूलजालकवातलाः ।
 किंन्रः क्षिन्नश्च तानष्टौ वलीन् कर्म्मसु वर्जयेत् ॥
 गतिवैषम्यविस्त्रस्त्याव्यदीयाश्चनिस्रवाः ।
 फेनिलच्युतधार्यूलं वस्त्रेः स्याद् वस्त्रिदोषतः ॥

6. Śīthilabandhana : The tubes do not fit the bags well, so during compression of the bags, the injected fluid runs out by the side of the tube.
7. Pārśvacchidra or leaky : Having slit on the side, the tube may injure the soft parts by rubbing against them.
8. Bakra or curved : The motion of the injected fluid would be curvilinear. It will strike a side of the rectum and so would not go inside the gut.

II. Bags—

1. Māṃsala or fleshy : The bag emits bad smell.
2. Chidra or leaky : The injection escapes outside.
3. Viṣama or uneven : Parts are unequally compressed and so the injection does not issue in a forcible jet.
4. Sthūla or thick : It is difficult to grasp the bag and so it can not be forcibly compressed.
5. Jālaḥ or having a network : The injection comes out.
6. Vātala or hollow, airy and incompressible : If air can not be expelled out, froth forms in the injection ; and so air is pumped into the rectum.
7. Chinna or torn : The injection flows down.
8. Klinna or moist : The injection can not be forced out.

Suśruta mentions eleven defects of tubes and five defects of bags of the Vasti yantra.¹

¹ अतिस्थूलं कर्कशमवनतमणमिन्नं सन्निकृष्ट विप्रकृष्ट कर्णिकं सूक्ष्मातिच्छिद्रमतिदीर्घ-
मतिह्रस्वमित्येकादश नेत्रदोषाः । वहलतान्यता सच्छिद्रता प्रसौर्णता दुर्विज्ञतेति पञ्चवस्ति
दोषाः ।

Suśruta Saṃhitā, IV, xxxv.

ऋजुनेत्रं विधेयं स्वात्तव सम्यग्विज्ञानता ।

अतिस्थूले कर्कशे च नेत्रे चावनते तथा ॥

I. Tubes—

- | | | |
|-------------------------|---------------------|---|
| 1. Atisthūla : | Too thick. | } Such tubes injure the rec-
tum and so cause pain. |
| 2. Karkaśa : | Rough. | |
| 3. Avanata : | Curved. | |
| 4. Anu : | Too thin. | } It becomes use-
less to inject
fluids into the
rectum. |
| 5. Bhinna : | Broken. | |
| 6. Sannikṣ ṭa Karṇika : | Projection near? | |
| 7. Viprakṣṭa Karṇika : | Projection distant? | } Injure the rec-
tum which bleeds. |
| 8. Sūkṣma : | Small orifice. | |
| 9. Atihrasva : | Too short. | } It becomes difficult to inject
as the fluid comes out. |
| 10. Atichidra : | Large orifice. | |
| 11. Atidīrgha : | Too long. | } Too much fluid passes into
the rectum and so pain is
complained of. |

II. Bags—

- | | | |
|------------------|-------------------|---|
| 1. Vahalatā : | Fleshy. | } It is difficult to tie the bags
over the tubes properly. |
| 2. Prastīrṇatā : | Large. | |
| 3. Sacchidratā : | Perforated. | } No fluid can be forced
into the rectum and so
the instrument is use-
less. |
| 4. Durviddhatā : | Difficult to tie. | |
| 5. Alpatā : | Small. | Small quantity of fluid passes into the
rectum. |

गुदे भवेत् चतं रुक् च साधनं पूर्ववत् स्मृतं ।

आसनं कर्णिके नेत्रे भिन्नेऽणौ वाप्यपार्थकः ॥

अवसेको भवेद्वस्तेस्तस्यादोषा निवर्जयेत् ।

प्रकृष्ट कर्णिके रक्तं गुदमर्शं प्रपीडनात् ॥

चरत्यवापि पित्तघ्नो विधिर्वस्तिश्च पिच्छिलः ।

ऋक्षत्वणस्त्रोतसि च क्लेशो वस्तिश्च पूर्ववत् ॥

प्रत्यागच्छंस्ततः कुर्याद्रोगान्वसि विघातजान् ।

दीर्घं महास्त्रोतसि च ज्ञेयमत्यवपीडवत् ॥

प्रस्तीर्णं वहले चापि वस्त्रौ दुर्वज्ज दोषवत् ।

वस्त्रावन्त्येऽत्यता वापि द्रव्यस्यात्यगुणा मताः ॥

दुर्वज्जे चाणु भिन्ने च विज्ञेयः भिन्नं नेत्रवत् ।

16. UTTARA-VASTI.

Urethral, Vaginal and Uterine Tubes.

Injections into the urethra and vagina are also recommended to be thrown in by similar contrivances : the tubes being adopted in length and circumference to the length and breadth of the passages for which they are intended.

1. Tubular Instruments for the Urethra.

The tubes intended for applying medicines into the male urethra is recommended to be twelve aṅguli long. Suśruta¹ advises us to use tubes fourteen aṅguli long. It is to be made of gold and is called Puṣpanetra. Its circumference is equal to that of a stalk of flower of Jāṭī (Jasminum Grandiflorum) or Mālatī (Echites Crayophyllata, Rox.), and the lumen of the tube allows a mustard seed to pass through it. It is provided with an annular projection just at the central part. Caraka² says that

वस्तिरुत्तरसञ्जस्यविधिं वच्चाभ्यतः परं ॥
 चतुर्दशाङ्गुलं नेवमातुराङ्गुलं सम्मितम् ।
 मालतीपुष्पवन्तायं किद्रं सर्षप निर्गमम् ॥
 मेदूयामसमं केचिदिच्छन्ति खलु तद्विदः ।
 स्नेह प्रमाणं परमं कुञ्चयाव प्रकीर्तितः ॥
 पञ्चविंशदधोमात्रां विदध्याद् बुद्धिकल्पिताम् ।
 निविष्टकर्णिकं मध्ये नारीणां चतुरङ्गुलि ॥
 सूत्रस्रोतः परीणाहं सुदृढं वा हि दशाङ्गुलं ।
 तासामपत्यमार्गे तु निदध्याच्चतुरङ्गुलम् ॥
 द्वाङ्गुलं सूत्रमार्गे तु कन्यानाम् त्विकमङ्गुलम् ।
 विधेयं चाङ्गुलं तासां विधिवद्वच्चाते यथा ॥

Suśruta Saṁhitā, IV. xxxvii.

² पुष्पनेत्रस्य द्वैमं स्यात् सूत्रमौत्तरवस्तिकम् ।

it has two projections while Vāgbhata¹ describes three. The bag is to be made of goat's bladder. A probe is first passed into the urethra to examine its condition and then the tube is introduced up to the length of six *añguli*. The bladder which contains the injection and which is tied tightly round the tube, is then compressed to force the fluid into the urethra. The tube of course, varies in size according to the dimensions of the organs of generation.

For the female, the *puspanetra* is described to have the length of ten *añguli*. The projection is at a distance of four *añguli* from the base. The circumference of the tube varies according to the width of the urethral canal. The calibre of the tube allows a moong to pass through it.²

जातीपुष्पस्य वृन्नेन समं गोपुच्छसंस्थितम् ।

रौप्यं वा मर्षपच्छिद्रं द्विकर्णं द्वादशाङ्गुलम् ॥ ४२ ॥

Caraka Saṁhitā, VIII. ix.

¹ आतुराङ्गुलमानेन तत्रैव द्वादशाङ्गुलं ।

वृत्तं गोपुच्छवत् मूलं मध्ययोः कृतं कर्णिकं ।

मिद्धार्थकं प्रवेशार्थं शृङ्खलं हेमादि सम्भवं ।

कुन्दाश्चमारं सुमनः पुष्पवृन्तोपमं दृढं ।

तस्य वन्निष्ठं दुलघुर्मात्रा शुक्तिर्विकल्पः वा ॥

* * * *

नेत्रं दशाङ्गुलं मुद्गप्रवेशचतुरङ्गुलं ।

अपत्यमार्गे योज्यं स्याद्दशाङ्गुलं सूत्रवत्सर्पिणि ॥

सर्वकृच्छ्रविकारिणं बालानां श्लेकमङ्गुलम् ।

Aṣṭāṅga Hṛdaya Saṁhitā, I. xix.

² पुष्पनेत्रं प्रमाणान्तु प्रसदानां दशाङ्गुलम् ।

सूत्रस्रोतः परीणाहं सूत्रस्रोतोऽनुवाहि च ॥

गर्भमार्गे तु नारीणां विधेयं चतुरङ्गुलम् ।

द्व्याङ्गुलं सूत्रमार्गे तु बालायां स्वेकमङ्गुलम् ॥

Caraka Saṁhitā, VIII. ix

Catheters.

It is curious to find no description of so important an instrument as the catheter. Injections were thrown into the urethra but the tube used was always a straight one, having the length of six aṅguli; so it could not possibly have reached the bladder in the male, and nowhere has the claim been put forward for it to have done so. The tube might have served well for the females. The female catheter of the Greeks, as preserved in the Naples museum, is 0.98 mm. long and is straight throughout (Milne).

In the Atharvaveda Saṁhitā,¹ however, we find a hymn, unmistakably alluding to the use of catheter in ancient times.

Against obstruction of urine with a reed.

“This hymn is intended to be used in a rite for regulating the flow of urine’. The reed implies some primitive form of a fistula urinaria, the vastīyantra (one of the nāḍīyantrāṇi) of the late physicians—who however do not appear to have made frequent uses of it”.

* * * * *

6. What in thine entrails, thy (two) groins, what in thy bladder has flowed together—so be thy urine released, out of thee with a splash! all of it. (In the groin are two vessels located in the two sides affording access to the receptacle of urine).

7. I split up thy urinator, like the weir of a tank—so be thy urine released, out of thee, with a splash! all of it.

8. Unfastened (be) thy bladder orifice, like that of a water-

¹ Book 1. 3. Whitney's translations and annotations.

holding sea—so be thy urine released, out of thee, with a splash ! all of it.

9. As the arrow flew forth, let loose from the bow,—so be thy urine released, out of thee with a splash ! all of it”.

2. Tubular Instruments for the Vagina.

Similarly injections were thrown into the vagina. The vaginal tube should be thicker than the urethral tube and in circumference should be equal to that of the little finger. It should be introduced into the vaginal canal up to a distance of four aṅguli, whereas into the urethra, the tube was allowed to enter up to a distance of two aṅguli only in the adults and of one aṅguli only in the girls.¹

3. The Uterine Tubes.

The *uttara-vasti* comprises the urethral syringe—male and female—and the vaginal and uterine clysters. No distinct uterine tube is described in the text books. But *Suśruta*² says

¹ द्वादशाङ्गुलं नेत्रं मध्यं च कृतकर्णिकम् ।

मालतिपुष्पवृक्षामञ्जिद्रं सर्षपनिर्गमम् ॥

* * * *

स्त्रीणां कनिष्ठिकास्थूलं नेत्रं कुर्याद्दशाङ्गुलम् ।

सुद्वप्रवेश्यं योज्यञ्च योन्यन्तश्चतुरङ्गुलम् ॥

द्वाङ्गुलं सूत्रमार्गे च सूक्ष्मं नेत्रं नियोजयेत् ।

सूत्रकञ्चविकारिषु बालानामेकमङ्गुलम् ॥

Sārāgadhara Saṁhitā, III. vii.

Bhāva Prakāśa, I. ii.

² उड्बुजान्वै स्त्रियै दद्यादुत्तानायै विचक्षणः ।

कल्पतरस्य कण्ठायै दद्यात् सुसुदु पीडितं ।

विकर्णिकेन नेत्रेण दद्याद्योनिमुखं प्रति ।

गर्भाशयं विगुह्यार्थं स्नेहेन दिगुणेन तु ।

अप्रत्यागच्छति भिषक् वस्तावत्तरसंज्ञिते ।

that to apply *uttara-vasti* to a female, she is advised to lie supine, keeping her knees flexed and well raised. For a girl the quantity of injection is one *prasṛta*.

To purify the uterine cavity, apply a clyster of twice the quantity of oleaginous medicines, inside the vagina by means of a tube having three rings. If after the application, the oily medicine does not flow out, then apply a second clyster containing medicines of the group called *śodhana* or purifiers, into the rectum; or let the clever surgeon introduce a probe into the space of the clyster; or press under her navel deeply by his closed fist. As the object of the injection is to clean the cavity of the uterus, there can be no doubt that a uterine tube is referred to in the passage. Again the precautions recommended if the injections do not come back easily, point to a uterine tube to have been used, for injections into the vagina can not be delayed in coming out. The Hindu writers often confounded the intra-uterine and urethral injections with the vaginal clyster. Caraka¹ says: "The *uttra-vasti* is to be used for the females during the period of menstruation, for then the uterus, being in a condition fit for impregnation, has its mouth open and so can easily be reached by the injection." This shows that uterine medication to be the object aimed at by the clyster.

भूयो वस्ति' विदध्यात् संयुक्तं शोधनैर्गणैः ।

गुदे वर्ति निदध्याद् शोधनद्रव्यं संभृतां ।

प्रवेशाद्वा मतिमान्वस्तिद्वारमर्थेषणीम् ।

पीडयेद्वाप्यधोनाभेर्वलिनोत्तरमुष्टिना ।

Suśruta Samhitā, IV, xxxvii

¹ स्त्रीणाञ्चार्त्तवकाले तु प्रतिकर्म तदाचरेत् ।

गर्भासना मुखं स्नेहं तदादत्ते ह्यपात्रता ॥

गर्भं योनिस्तदा शीघ्रं जिने गृह्णाति मारुते ॥

Caraka Samhitā, VIII, ix.

The Greeks were no better, for Milne also complains: "It is difficult to separate ancient descriptions of injections into the vagina from those into the uterus, for the terms for the two parts are frequently interchangeable". Again he says: "It is probable that at other times under the heading of 'injections of the bladder', only irrigation of the urethra is meant".¹

18. TUBULAR INSTRUMENTS FOR INHALATIONS AND FUMIGATIONS.

The tubes for smoking were made, like the vasti tubes, of various metals, or glass or wood. Caraka² describes it as a straight tube having three pouches. The end of the tube is equal in diameter to that of a plum seed. Sārṅgadharma³ adds that a reed or bamboo pipe will also serve the purpose. It is described as a straight tube, the broad base of which admits the patient's thumb while the narrow end, a plum seed. Suśruta⁴ describes the base

¹ Græco-Roman Surgical Instruments, P. 107-8.

² चतुर्विंशतिकं नेत्रं स्वहृत्पुष्पैर्विचित्रेन ।
 द्वाविंशदङ्गुलं स्नेहे प्रयोगे चाद्विंशत्यनेन ॥
 ऋजुविकोषफलितं कोलास्थ्यप्रमाणितम् ।
 वस्तिने च समद्रव्यं धूमने च प्रशस्यते ॥१६

Caraka Saṁhitā, I. v.

³ धूमनाडी भवेत्तत्र विखण्डा च विपर्विका ॥१०
 कनीष्ठिका परीणाहा राजमाषागमानरा ।
 धूमनाडी भवेद्दीर्घा शमने रोगिणीऽङ्गुलैः ॥११
 चत्वारिंशन्मितैस्तद्वृत्तिविशेषैर्दौ स्मृता ।
 तीक्ष्णं चतुर्विंशतिभिः कासघ्ने षोडशोन्मिते ॥१२
 दशाङ्गुलिर्वागमनीये तथासप्ताद्रवणनाडिका ।
 कलायमण्डलमूला कुलत्यागमरन्ध्रका ॥ १३

Sārṅgadharma Saṁhitā, III. ix.

⁴ तत्र वस्तिने तद्रव्यधूमने च द्रव्याणि व्याख्यातानि भवन्ति । धूमने तस्य कनीष्ठिका परीणाहग्रे कलायमात्रं श्रोतोमूलेऽङ्गुलपरिमाणं धूमवर्ति प्रवेश श्रोतोऽङ्गुलान्यष्ट चत्वारिंशत् प्रायोगिकं । द्वाविंशत् स्नेहेन । चतुर्विंशतिर्विचित्रेन । षोडशाङ्गुलं कासघ्ने वागमनीये च ।

and end of the tube to be equal in circumference to that of the thumb and little finger respectively. The orifice should allow a common pea to pass easily through the tube. Vāgbhāṭa¹ says that there are three pouches or dilatations of the tube, shaped like the half-open buds at equal distances from each other. The tube is supposed to consist of four equal parts. The first pouch is located at the end of the first part, the second and third pouches at the ends of the second and third parts respectively. Cakradatta² also describes it similarly.

Dr̥ḍhabala³ mentions another method of inhalation. He makes a paste of the medicines prescribed and smears it on a piece of silk cloth. This is then to be rolled round like a wick. This wick is to be dipped in ghee before use, and fire lit at one end, while the patient is to smoke it through the other end.

एने अपि कोलास्थिमावच्छिद्रे भवतः । व्रणनेवमष्टाङ्गलं व्रणधूपनार्थं कलायपरिमण्डलं
कुलस्थवाहिं स्रोत इति ।

Suśruta Saṁhita, IV. xl.

¹ वस्ति नेत्रं समद्रव्यं त्रिकोषं कारयेद्वज्रं ।

मूला, येङ्गुष्ट कोलास्थिं प्रवेशं धूमनेवकं ।

तीक्ष्णं स्नेहनं मध्येष्वेवैषिणं चत्वारि पञ्च च ।

अङ्गुलीनां क्रमात् पातुः प्रमाणे नाष्टकानि तत् ॥६॥

Aṣṭāṅga Hṛdaya Saṁhita, I. xxi.

² ऋजुत्रिकोषफलितं कोलास्थ्यप्रमाणितम् ।

वस्तिनेवसमद्रव्यं धूमनेवं प्रशस्यते ।

साईस्त्र्यंशयुतः पूर्णोहस्तं प्रायोगिकादिषु ।

नेत्रे कामहरे वंशहीनः शेषे दशाङ्गुलः ॥

Cakradatta, Dhūmapānādihikāra.

³ प्रपुन्दरीकं मधुकं शाङ्गं शं समनःशिलां ।

सरिचं पिप्पलीं द्राक्षामिलां सुरसमञ्जरीम् ॥

कृत्वा वर्त्तिं पिबेद्भूमं चौमचेलानुवर्त्तिताम् ।

घृताक्रामनु च चीरं गुड़ोदकमथापिवा ॥

Caraka Saṁhita, VI. xxii,

Both Caraka¹ and Śārīgadharā² advise us to make tubes of medicines, the fumes of which are advised to be smoked in the following manner:—Powder the medicaments and make a paste; measure one karsa; take a smooth reed (*Saccharum sara*, Rox.) twelve aṅguli long. Apply the paste round the reed, for a length of eight aṅguli. Dry it in shade. Remove the reed, leaving a dried tube of the paste. When required for smoking, light one end of the tube with a burning wick and smoke through the other end.

Caraka³ describes another inhaler, which consists of two earthen basins (*soraba*) placed upon each other, their edges being pasted with flour. The upper one is perforated at the centre for the reception of one end of the tube, the patient puts the other

¹ पिष्टा लिप्पेच्छरघौकां तां वर्त्ति यवसन्निभां ।
अङ्गुष्ठसन्नितां कुर्यादष्टाङ्गुलसमां भिषक् ॥
युष्कां निगर्भां तां वर्त्ति धूमनैवार्पितां नरः ।
संहतात्मग्निसंज्ञां पिवेत् प्रायोगिकीं सुखाम् ॥ ६ ॥

Caraka Samhitā, I. v.

² अथषिकां प्रतिपेच्च सुशुक्लां द्वादशाङ्गुलाम् ।
धूमद्रव्यस्य कल्कं न लेपयाष्टाङ्गुलः स्मृतः ॥
कल्कं कर्षमितं लिखा कथा युष्काच्च कारयेत् ।
इषिकामपनीशाय संहतातां वर्त्तिमादरात् ॥
अङ्गारैर्दीपितां कृत्वा धृत्वा नेत्रस्य रन्मुके ।
उदनेन पिवेद्भूमं वदनेनैव संत्यजेत् ॥
नासिकास्थं ततः पीत्वा मुखेनैव वमेत् सुधीः ।

Śārīgadharā Saṅgraha, III. ix.

³ मधूच्छिष्टं सज्जरसं छृतं सल्लकसंपटे ।
कृत्वा धूमं पिवेच्छृङ्गं वालं वा स्नायु वा गवाम् ॥
श्लोणाकवर्द्धमानानां नाड्यो युष्कां कुशस्य वा ।

Caraka Samhitā, VI. xxi.

end into his mouth for inhalation. The lower pot contains glowing charcoal of catechu (*Accacia catechu*. Linn.) wood, over which are put pills of necessary medicines. The tube is from eight to ten aṅguli long.¹ This inhaler is intended for phthisical subjects. It is useful for allaying cough and exciting emesis. This instrument is called *mallaḥka sampuṭa* or *sorāba sampuṭa* or a pair of earthen basins. In such an apparatus Caraka recommends us to put powders of cow's horn, hairs, nerves and ligaments, besides other medicines. Susruta², Vāgbhaṭa³ and Cakradatta⁴ also describe it. Śārṅgadharā⁵ however reserves this instrument for fumigating wounds only.

The length of the pipe will vary according to the different kinds of smoking prescribed by the physician. There are five kinds of smoking narrated :—

1. Śamana, madhya, proyogika — medium.
2. Brīṇhana, snehana, mṛdu — mild.

¹ दशाङ्गुलीन्मितां नाडीं अथवाष्टाङ्गुलीन्मिताम् ।

शरावसंपुटच्छिद्रे कृत्वा त्रिङ्गुलं विचक्षणः ॥

वैरेचनं मुखेनैव कासवान् धूममापिवेत् ।

Caraka Saṁhitā, VI. xxii.

² इतरयोर्व्यपेत धूमोद्धार स्थिरे समाहिते शरावे प्रक्षिप्य वत्सि मूलच्छिद्रेणान्येन शरावेण पिपाय तस्मिन्च्छिद्रे नेत्रमूलं संयोज्य धूममासेवेत् ।

Susruta Saṁhitā, IV. xl.

³ शराव सम्पुटच्छिद्रे नाडीं न्यस्य दशाङ्गुलां ।

अष्टाङ्गुलां वा वक्त्रेण कासवान् धूममापिवेत् ॥

Astāṅga Hṛdaya Saṁhitā I. xxi.

⁴ अथवा सष्टतान् शङ्कुन् कृत्वा मल्लिकासम्पुटे ।

नवप्रतिश्यायवतां धूमं वैद्यः प्रयोजयेत् ॥

Cakradatta, Nāsāroga Cikitsā.

⁵ See foot-note 2. P. 145.

- | | |
|----------------------------|---------------|
| 3. Recana, śodhana, tīkṣṇa | — strong. |
| 4. Kāsaghna | — anti-cough. |
| 5. Vāmana | — emetic. |

So the length of the tube would vary thus—

1. Caraka¹

			Anguli.
In strong smoking	...	...	24
„ medium „	...	...	32
„ mild „	...	...	96

2. Suśruta.²

In medium smoking	...	...	48
„ oleaginous „	...	...	32
„ brain-sedative „	...	...	24
„ anti-cough or emetic „	...	...	16

3. Vāgbhaṭa.³

In strong smoking	...	...	24
„ medium „	...	...	32
„ mild „	...	...	40

4. Śārṅgadhara.⁴

In medium smoking	...	...	40
„ mild „	...	...	32
„ strong „	...	...	24
„ anti-cough „	...	...	16
„ emetic or wound-fumigation	...	...	10

FUMIGATION.

Similarly wounds are said to be purified by suitable medicinal fumigation. In the purification of wounds by fumigation, we get a glimpse of the antiseptic method of treatment in its

¹ See foot-note 2. P. 140.

² See foot-note 4. P. 140.

³ See foot-note 1. P. 141.

⁴ See foot-note 3. P. 140.

embryonic form. Suśruta¹ recommends the tube to be eight aṅguli long and to have the circumference of a common pea; and its orific should be of the size of a kulattha (*Dolichos biflorus*, Linn.). The fumes of medicated substances from the inside of any closed pot containing fire, pass out through the tube and are allowed to play on any sore to purify it. For this purpose two earthen pots—*śorāba samputa*—may conveniently be used as before. Śārṅgadhara² uses a tube ten aṅguli long and recommends us to use *Nimbā* leaves (*Azadirachta Indica*) for wound-fumigation. As another instance of the application of the principles of antiseptic methods to practical therapeutics, we may mention the use of medicinal injections into the cavity of the uterus to rectify its morbid conditions.³

A similar instrument was used to fumigate the uterus and vagina in various diseases of these parts. "Fumigation", says Suśruta,¹ "is to be applied to the vagina by burning the

¹ व्रणनेवमष्टाङ्गुलं व्रणधूपनार्थमकलायपरिमण्डलं कुलत्थवाहिस्तोतइति ।

Suśruta Samhitā, IV. xl.

स क्षौमयवसर्पिर्भिर्धूपनाङ्गैश्चधूपयेत् ।

Ibid. IV. i.

² दशाङ्गुलिर्वामनीये तथासग्राद व्रणनाडिका ।

कलाय मण्डलस्थूला कुलत्थागमरन्ध्रका ॥१३

* * *

शरावसम्पुटे चिक्षा कल्कमङ्गारदीपितम् ॥१७

क्षिद्रे नेत्रं निवेश्याथ व्रणन्तेनैव धूपयेत् ।

* * *

व्रणे निम्बवचायश्च धूपनं संप्रशस्यते ।

Śārṅgadhara Saṁgraha, III. ix.

³ See foot note 2, P. 1318.

⁴ सर्भसङ्गे तु योषिं धूपयेत् कृष्णसर्पनिर्मोक्षेण पिण्डीतकेनवा ।

Suśruta Samhitā, III. x.

slough of a snake (Bungarus) or pinditaka (?) wood, in cases of obstructed delivery of the fetus. Caraka¹ mentions fumigation of the vagina by burning Bhurjapatra (Betula Bhojpatra), glass, precious stones and the slough of a snake as one of the means for removing the placenta. To remove the after pains and difficulty in micturition and defæcation, Suśruta² advises us to fumigate the vagina. He recommends fumigation of the uterus with purifying medicines. In fumigating these parts, the Hindu surgeons desired a local action, and did not share in the belief, held by some of the Greek gynæcologists³ that "the uterus was an animal within the body which could wander about, being attracted by pleasant smells and repelled by disagreeable smells".⁴ The Arabs also did not believe uterus to be an animal. This method of treatment was well known to the Greeks; for Hippocrates⁵ writes that "fumigation with aromatics promotes menstruation and would be useful in many other cases, if it did not occasion heaviness of the head". He "directs us to take a vessel which holds about four gallons and fit a lid to it so that no vapour can escape from it. Pierce a hole in the lid, and into this aperture force a reed about a cubit in length so that the vapour cannot escape along the outside of

¹ भूर्जपत्रकावमणि सर्पनिर्मोक्षेशस्य शोणि धूपयेत् ।

Caraka Saṁhitā, IV. viii.

² कटुकालावकृतवैधन सर्षप सर्पनिर्मोक्षैर्व्या कटुतैलविमिश्रैर्योनिमुखा धूपयेत् ।

Suśruta Saṁhitā, I. I. x.

³ Aretæus, *Morb. Acut.* ii. 11.
Plato's *Timæus*.

⁴ *Græco-Roman Surgical Instruments*, p. 158.
Adon's *Commentary on Paulus Ægineta*, Vol. I. Bk. ii. p. 636-37.

⁵ See also in the Hippocratic treatises, as *Nat. Mul.* vii. 9; 1 *Morb. Mul.* vii. 1; 11 *Morb. Mul.* xl. 20, 21; *Steril.* vi. 3; *Superfoet.* ix. 3. x. 9. II.

the reed. The cover is then fixed on the vessel with clay.”¹ Oribasius² and Soranus³ used similar instruments for the purpose.

DISINFECTION OF ROOMS, CLOTHES, etc.

Caraka¹ says that if peacock's feather, bones of vaka bird, white mustard and red sandal wood, well powdered and mixed with ghee, be used in fumigation, the poison of a room, beddings, seats and clothes, is got rid of. Śārṅgadhara² advises us to disinfect a sick room by the fumes caused by burning the following substances with ghee : peacock's feather, Nim leaves (Melia Azadirachta), Vrihati, pepper, asafoetida, Jotāmānsī (Nardostachys jotamansi), seeds of Sālmali (Bombax malabaricum), goat's hair, slough of a serpent, cat's faeces and ivory. Suśruta³ advises fumigation of a sick room for a surgical patient for

¹ Græco-Roman Surgical Instruments P. 159.

² Coll. x.xix.

³ Soranus. xviii.

¹ शिखिवर्धवलाकास्थीनि सर्षपाथन्दनं च घृतयुक्तः ।

धूमो गृहशयनासनवस्त्रादिषु शस्यते विषनुत् ॥५८॥

Caraka Saṁhitā, VI. xxv.

² मथूरपिच्छं निम्बस्य पत्राणि वृक्षतीफलम् ।

मरिचं हिङ्गु मांसी च वीजं कार्पाससम्भवम् ॥

कागरोमाहिनिर्मोक्तं विष्टा वैडालिकी तथा ।

गजदन्तश्च तच्चूर्णं किञ्चिद्घृतं विमिश्रितम् ।

गृहेषु धूपनं दत्तं सर्व्वन्वालयहाञ्जयेत् ।

पिशाचान् राक्षसाञ्जित्वा सर्व्वज्वरहरो भवेत् ॥

Śārṅgadhara Saṁgraha, III. ix.

³ सर्षपारिष्टपत्राभ्यां सर्पिषा लवणेन च ।

द्विरन्ध्रं कारयेद्धूपं दशरात्रमसन्दिह्यतः ॥

Suśruta Saṁhitā, I. xix.

ten days, morning and evening, after the operation has been performed.

15. TUBULAR INSTRUMENT FOR CUPPING.

Generally cow's horn is recommended for the purpose. It is eighteen *aṅguli* long, its base, forming the mouth of the instrument, is three *aṅguli* wide (*Vāgbhaṭa*).¹ It is conical in shape and the cone is said to be either curved or straight. The other end is pointed and perforated to the extent of allowing a mustard seed to pass through it. The narrow end, however, is made to assume the shape of a woman's nipple by winding thread round it. This facilitates the operation of suction by the mouth of a surgeon when the broad end is placed against any diseased area of the patient's body. *Suśruta*² mentions its use in blood-extraction. For extracting blood, the part must be scarified before its application; and to facilitate the operation, the part should be fomented (*Yogarātnākara*).³ After suction, the horn is to be covered by a piece of cloth or a small bladder of animals.

*Vāllūki*⁴ describes the *śṛṅga* thus :—"It is the horn of a white cow, half-moon shaped and seven *aṅguli* broad. The orifice

¹ वृङ्गलासं भवेच्छृङ्गं चूर्षणं ऽष्टादशाङ्गुलं ।

अशेषिद्वार्थकच्छिद्रं सुनन्धचुचुकाकृति ॥

Aṣṭāṅga Hṛdaya Saṁhita, I. xxv.

² तत्र प्रच्छिदे तनुवस्त्रपटलावनद्धेन शङ्केन शोणितमवसेचयेदाचूर्षणात् ।

Suśruta Saṁhitā, I. xiii.

³ स्वेदं विदध्यात्कुशलश्च नाद्या शङ्केन रक्तं बहुशः हरेत् ।

Yogarātnākara Arbuda cikitsā.

⁴ विषाणः श्लेष्मणोरिन्दूचक्रं समाङ्गुलायतम् ।

क्षिप्तान्तः पिचुपेशिकं योज्यं वातयुतेऽसृजि ।

चङ्क्रे मूलवन्धूले क्षिद्रमयेऽस्य मुद्गवत् ।

Vāllūki quoted in *Nibandha Saṁgraha*, I. xiii.

at the base is equal in circumference to that of the base of the thumb, while the end which is perforated admits a moong. This orifice at the end is closed by a wick of cotton". Cakra-pānidatta says that the horn should be three aṅguli long, and its orifice should be of the size of the stalk of an oleander flower.

Suśruta mentions a peculiar use of the horn¹: the extraction of an insect, cerumen, etc. from the middle ear by means of a horn or a probe. The horn was evidently used as an apparatus for suction, and Suśruta describes suction as one of the methods of extracting śalya from the body². Caraka³ uses horns and leeches to extract venom from a snake-bite; and Suśruta also refers to it. Besides the horns and cupping glasses, suction used to be accomplished by the surgeon's mouth.

Similarly Paul⁴ says that foreign bodies may be sucked out from the ears with a reed.

On the method of suction as a mode of treatment, Erichsen⁵ says:—"In former days, when duels with the small swords were of frequent occurrence, persons called "suckers" who were often the drummers of a regiment, were employed to attend the wounded combatants. This treatment which was conducted with a certain degree of mystery, consisted in sucking the wound till all blood ceased to flow, and then applying a pellet of chewed

¹ कर्णच्छिद्रे वर्त्तमानं कीडं क्षेदमलादि वा ।

शङ्खेणापहरेद्धीमानथवापि शलाकया ।

Suśruta Samhitā, VI. xxi.

² See foot-note 3, P. 108.

³ दंशं वा चुषेन्मूखेन यवचूर्णं पांशुपूर्णम् ।

प्रच्छन् विधजलीकः शङ्खैः स्वाव्यं ततो रक्तम् ॥

Caraka Samhitā, VI. xxv.

⁴ Paul. VI. xxiv. and III. xxiii.

⁵ Erichsen's Surgery, Vol. I. p. 341.

paper or a piece of wet linen to the orifice ; in this way it would appear that many sword thrusts traversing the limbs were healed in a few days. The process of suction cleared the wound thoroughly of all blood, and drawing the sides into close apposition placed the parts in the most favourable condition possible for union by primary adhesion. This practice might, perhaps, in many cases advantageously imitated in the present day by means of a cupping glass and syringe".

We also find Suśruta¹ describing a vasti yantra in the treatment of snake-bite. The tube is open at both ends, one end is applied to the part bitten by the snake, while to the other end the surgeon puts his mouth to suck out the poison. So this vasti yantra may be compared to the modern aspiration syringe.

Cupping instruments of metal or horn are still used by the Arabs in Kordofan and Sir R. Pasha² suggests that cupping is possibly borrowed by the west from the "most perfect physicians" the Arab. But now we are confident that the credit is due to the Hindus.

ALĀBU YANTRA.

Alābu or gourd is described to be made of the bark of the succulent fruit called alābu (*Lagenaria Vulgaris*). The pulp is scraped away and the bark is allowed to dry. Such a bark should be selected which is twelve and eighteen aṅguli in length and circumference respectively. Its mouth should be circular and should have a diameter of three or four aṅguli. A fire is to be lit inside it by burning a strip of dry cloth to produce a vacuum, and the

¹ प्रतिपूर्य सुखं वस्त्रैर्हितमाचूषणं भवेत् ।

Suśruta Saṁhitā, V. v.

² Vide Third Report, Wellcome research laboratory at Gordon. P. 316.

instrument to be applied instantly to the intended part of the patient's body. It should be thus used to drain blood and phlegm from the body (Vāgbhata¹). In modern times cupping glasses are used for like purposes in a similar manner.

Vāllūki² describes the alābu yantra thus:—"The mouth of the instrument is well formed and has the diameter of four aṅguli. The body has the circumference of eight aṅguli and is well smeared with a paste of black mud. It is used for drawing out blood". In yogaratnākara³, śrīṅga and alābu are directed to be used for extraction of blood from accidental wounds. Caraka mentions the use of alābu for blood-extraction⁴.

Another instrument known as the ghaṭī yantra was used exactly in the same way⁵. It is said to consist of a brass pot

¹ सप्तदशशङ्खलीऽलावुर्नाहि त्वष्टा दशशङ्खः ।

चतुर्विंशल वृत्तासो दीप्तोऽन्तः श्लेष्मरक्तहृत् ॥

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxv.

² अष्टशङ्खपरौणाहा चतुरङ्गलनालसम्मिता सुमुखी कृष्णमृदान्निपा तनुः श्लेष्मा रक्तावसेचनेऽलावुरिति ।

Vāllūki quoted in Nibandha Saṁgraha I. xiii.

सान्नादीपयाऽलाव्वा ।

Sūratā Saṁhitā, I. xiii.

³ क्षिप्ते भिन्ने तथा विद्धे चते सद्यो भिषगवरः ।

पटसूत्रेण संखेदं व्रणं व्रणविशारदः ॥

सुहृर्महर्षथा दुःखं ना प्राप्नोति व्रणौ नरः ।

अथवा दीप्यलवणपोटल्या स्वेदयन्मुहुः ॥

सक्तप्रया तप्तलोहपात्रसंयोगतः क्रमात् ।

दुष्टं रक्तं स्थितं चापि शङ्खलाव्वादिभिर्हरेत् ॥

Quoted in Yogaratnākara.

रुधिरागमार्थमथवा शङ्खलावुभिराहरेत् रक्तम्—

Caraka Saṁhitā, VI. vii.

⁵ तद्वदघटीहिवा गुब्ब विलयोन्नमने च सा ।

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxv.

which is still used commonly in India by all classes of people for drinking purposes. A fire should be lit inside as before and the ghaṭī applied to the surface of the body covered by a piece of cloth. It soon becomes firmly fixed and is thus used to raise abdominal tumours by means of it for purposes of correct diagnosis and also to effect its cure by subsidence. It is still used by the common people for the same ends.

Caraka¹ says :—"After the abdominal tumour has been relaxed or softened a little by fomentation and oleaginous application, it is to be covered by a piece of cloth. Then inside a small ghaṭī, a fire is to be lit by burning kuśa and other forms of grasses ; the pot is then to be inverted and pressed over the part covered by the cloth. By this way, the tumour would be drawn upwards *i.e.* be made prominent. The ghaṭī is then to be taken away and after removing the cloth, and examining the extent of the tumour, it is to be incised. The different shapes of the incisions are called vimārga, ajapada and ādarsa. After incision, the tumour is to be pressed and rubbed with fingers. But the intestines and the heart must not be touched."

The extraction of blood by means of cups, has been practised from remote antiquity. It is interesting to note that both the Latin and Greek terms—*cucurbitula* and *σικυα* signify a gourd ;

¹ स्निग्धस्निग्धशरीराय गुच्छं शैथिल्यमागते ॥

परिवेष्ट्य प्रदीप्तांस्तु वल्ज्जानथवा कुशान् ।

भिषक् कुम्भं समावाप्य गुच्छं घटमुखं क्षिपेत् ॥

स गृहीतो यदा गुच्छसदा घटमथोद्धरेत् ।

वस्त्वान्नरं ततः कृत्वा भिन्द्याद्गुच्छप्रमाणवित् ॥

and we know that *Alābu* also means a gourd. It is curious that the instrument should have been known to the ancient Hindus and Greeks by the same name.

Prosper Alpinus¹ (16th century) who wrote a book on the state of medicine in Egypt in his time, gives drawings of cupping horns he saw there. The horns were those of young bulls, highly polished, with a small hole at the top, by which the air was extracted by suction. To close the orifice a small tab of parchment was taken into the mouth and affixed by the tongue. The Egyptians also used cupping glasses, by suction and not by fire, a method evidently unknown to them.

Hero of Alexandria (B. C. 285—222) describes an interesting form of cup. Milne summarises his account thus :²—"The figure shows a cup of ordinary flattened form, divided into two by a diaphragm. Two tubes pass through the fundus, one passing through the diaphragm, the other not. Each of the tube is fitted with another which is open at its inner end but closed at its outer end and provided with a small cross bar to rotate it. Each of these sets of tubes is perforated by small openings. In the case of the short tubes, these are outside the cup, in the case of the long tube they are inside the cup, in the chamber shut off by the diaphragm. By rotating the piston these openings can be placed in apposition or not at will, thus forming valves. Open valve A by placing the hole in apposition. Close valve B by turning the holes away from each other. The inner chamber of the cup is now shut off except for the small hole A. Apply the mouth to the valve A, and suck the air out of the chamber. Close valve A. Apply the cup to the affected part. The advantage

¹ *Do Med. Aegyptiorum*, Ed. 1541 lib. ii. ch. xii. p. 139.

² *Græco-Roman Surgical Instruments*, P. 104.

of this arrangement is that the affected part is not directly sucked upon by the mouth ; and the instrument is therefore more pleasant for the operator to use”.

Celsus¹ thus describes the different kinds of cups :—“There are two kinds of cups, bronze and horn. The bronze is open at one end and closed at the other ; the horn, open at one end, as in the previous case, has at the other end, a small foramen. Into the bronze kind, burning lint is placed, and then the mouth is fitted on and pressed until it sticks. The horn is placed empty on the body, and then by that part where the small foramen is, the air is exhausted by the mouth, and the cavity is closed off above with wax and it adheres in the same way as before. Either may advantageously be constructed, not only of these varieties of materials but of another substance. If other things are not to be had, a small cup or a narrow mouthed jar will answer the purpose. When it has fastened on, if the skin has previously been cut with a scalpel, it extracts blood ; but if it be entire, air”.

Paul² remarks that “those which are made with longer necks and broader bellies are possessed of a strong power of attraction.” Both Oribasius³ and Aretaeus⁴ allude to them. Antyllus says that there are three materials of which cups are made—glass, horns, and bronze. A good number of such cups occur in the Naples, British and Scottish National Museums.

¹ Celsus, II. xi.

² Paulus Ægineta, VI. xlii.

³ Med. Coll. VII. xvi.

⁴ De Morb. Acut. I. 10

Albucasis¹ gives a full account of dry cupping. In applying the instrument he advises us either to create a flame in it, or to fill it with hot water. He gives drawings of various instruments of cupping. Rhases speaks of applying a glass or a cupping instrument to draw off blood after leeching. The other Arabians give little additional information.

In modern times, cupping glasses are used in the same way as before.

V. Śalākā or Rods.

The rods, or pricker-like instruments, or probes are described to be of various kinds and are recommended to be used for various purposes²; so their length and circumference would vary according to some special uses required of them. Suśruta³ says: "There are two kinds of śalākā with their ends shaped like the head of the earthworm. They are used for probing abscesses, and sinuses.

Two śalākā have their ends shaped like the wing of an arrow. These are to be used for raising any part for the purpose,

¹ Albucasis, Chirur., ii. 98.

² नाडीत्रणान् शल्यग्रमानुस्मार्द्यत्सर्जनः शनैः ।

करीरवासाह्निभिरपण्या वैपर्यङ्गिषक् ।

Suśruta Saṁhita, IV. i.

³ शलाकायन्त्राण्यपि नाना प्रकाराणि नाना प्रयोजनानि यथायोगपरिणाहदीर्घाणि च तेषां गण्डपदशरपुङ्गवमर्पणं षड्दीर्गमुखं द्वे द्वे एषस्य व्युहनचालनाहरणार्थमुपदिश्येते । मसृदल-
माकमुखं द्वे किञ्चिदानतां स्तोमगतशय्योद्धारणार्थं । पट्कापीसकृतीषीषाणि प्रसार्जन-
क्रियाम् । चीणि दर्श्याकृतौनि खल्लमुखानि क्षारीयधप्रणिधानार्थं । वीण्यन्यानि जाम्बवदनानि
वीण्यङ्गुशवदनानि षड्वाधिकास्त्रम्बभिरे तानि । नामात्रुदहरणार्थमेकं कालास्थिदलमात्रमुखं
खल्लतीक्ष्णं ह । अत्रनार्थमेकं कन्याशपरिजग्जनमुभयतो मुकुदाय । भुवमार्गाविशोधनार्थ-
मेकं मालतीपुष्पवन्तायप्रमाणपरिमण्डनमिति ।

Suśruta Saṁhita, I. vii.

after incision, of extracting any foreign body from it. Others assign to them the function of bringing together the lips of the wound caused by an abscess being opened and emptied.

Two *śalākā* have their ends shaped like the hood of a snake. They are useful for transferring any material from one part to another. Some of the simple probes used by the ancient Greek and Roman surgeons carried a single or double snake of *Æsculapius* at one end. But evidently it was meant as an ornamentation and served no useful purpose.

Two *śalākā* have their ends shaped like a fish-hook but are blunt. They are used for extracting any extraneous material from the muscles or bones".

The last six kinds of *Suśruta* are practically the same as the six *śaṅku* of *Vāgbhaṭa*,¹ which are the following :—

The *śaṅku* are six in number. Amongst these, two are twelve and sixteen *aṅguli* long respectively. They are used for the purpose of raising a foreign body upwards from the wound.

Two varieties have their ends shaped like the hood of a snake. They are ten and twelve *aṅguli* long ; and they are used for the purpose of moving a foreign body in the wound in all directions.

Two varieties have the shape of a fish-hook—the ends resembling the stem of an arrow. These are used for the extraction of foreign bodies from the wound.

¹ शङ्कुवः षड्भूतेषां षोडशद्वादशाङ्गुली ।

व्यूहनेऽहि फणावक्रौ द्वौ द्वादश दशाङ्गुली ॥

चालने शरपुङ्गवः मया बाह्याभ्यां वद्विशक्रतिः ॥२५॥

Suśruta¹ mentions another pair of śalākā which have their ends shaped like a masūra pulse, and slightly curved ; these are used for the purpose of extracting a foreign body from the external outlets of the body such as mouth, nose, etc. They are eight and nine aṅguli long respectively.

SWAB PROBES.

Six śalākā are used for the purpose of wiping out the principal excretory canals of the body *viz.*, rectum, nose and ears.² Their ends are covered with cotton like a head-dress (pāṅḍī). The two śalākā intended for the rectum, have the lengths of ten and twelve aṅguli respectively for short and long distances. So the two varieties of probes for the ears are eight and nine aṅguli long, while the other two kinds of probes for the nose are six and seven aṅguli long respectively. Some commentators are of opinion that these six śalākā are meant for clearing abscesses.

For similar purposes the Greek and Roman surgeons used the spathomele or spatula probe. Priscianus³ writes : "First of all we must frequently wipe away the clots of blood from the nose

¹ See foot note 2, P. 155.

उभेगण्डपदमुखे स्त्रोतभ्यः शल्यहारिणी ।

मसूरदलवक्त्रे द्वे स्यातामष्टनवाङ्गुली ॥२४

Aṣṭāṅga Hṛdaya Samhitā. I. xxv.

² कार्पास विहितोष्णीषाः शलाकाः षट्प्रमार्जने ।

पायावासान्न दूरार्थे द्वे दश द्वादशाङ्गुली ।

द्वे षट् समान्गुली घ्राणे द्वे कर्णेऽष्टनवाङ्गुली ॥२८॥

Ibid.

³ Priscianus. xiv.

with the end of a spathomele wrapped on the 'berry' with soft wool, and then occlude it by plugging with wool in the same way."

The use of probes, having the ends wrapped with wool, for wiping out discharge of pus from the ears of horse, is mentioned by Jayadatta Suri¹ in his 'Treatment of Horses.

SPOON-SHAPED PROBES.

Three probes are described to have their ends shaped like a khala or mortar with a conical cavity, and so they resemble a spoon. They are to be used for the purpose of applying caustic solutions, etc.²

Similarly cyathiscomele, which is a variety of spathomele in which the spatula is replaced by a spoon, is said to have been used by the Greek surgeons to mix, measure and apply medicaments. The specimens of these instruments occur in the Naples Museum. Sometimes the edge of the spoon is sharp and is recommended to be used as a curette. Serivonius Largus directs us to use the spoon of an ear specillum for the application of caustics to hemorrhoids.

पृथ्वाविष् जानीयात् शीथमभ्यन्तरोद्गम् ।

पिचुना वेष्टयित्वा तु शलाकायं समाहितः ॥

तेन कर्णान्तरे पृथं कर्षयित्वा विचक्षणः ।

पातितस्य सुवहस्य पूरयेन्मधूसर्पिषा ॥

Aśvavaidyaka, Ch. 34, v. 2. and 3.

NAIL-SHAPED PROBES.

Vāgbhāṭa¹ describes three other probes for the same purpose. They are eight aṅguli long; their ends are bent and resemble in size and shape the nails of the third, fourth, and fifth fingers respectively.

Paul² mentions a nail-shaped probe in the treatment of bubonecele. But this was applied as a cautery and not for the application of medicaments. Nail-shaped cauteries are also referred to by Hippocrates³ in the treatment of recurrent dislocation of the shoulder-joint.

JĀMVOVAUṢṬHA PROBES.

Three probes are called Jāmyovu-ṣṭha for their ends are shaped like the fruit of Jambul tree (*Eugenia jambolanum*).⁴ Three other śalākā have their ends shaped like aṅkuśa or elephant driver's goad.⁵ They may be made of any length required

¹ अष्टाङ्गुला निम्नमुखा लिखः चारिषच क्रमे ।

कनीनी-मध्यमाऽनामी-नखमान-समेर्मुखैः ॥

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxv.

² Paulus Aegineta, VI. lxx.

³ Hippocrates iii. 15.

⁴ See foot-note 2, P. 155.

शलाका जाम्बवीष्टानं चरिःश्री च पृथक् त्रयं ।

युञ्ज्यात् स्थूलानु द्वीर्वाणां,

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxv.

⁵ See foot-note 2, P. 155.

For the diagram of the aṅkuśa see Fergusson's Tree and Serpent Worship; Plate xxxiii. Sanchi. xxxvii. fig. I. and xxxviii. fig. 1 & 2.

by the surgeon. These six varieties are recommended for the purpose of applying caustic medicaments and the actual cautery.

Paul¹ mentions a gamma-shaped cautery in the radical cure of hernia. This cautery is shaped like the Greek letter Γ; so it resembles the añkuśa cautery of the Hindus. The añkuśa is similar in appearance to the Greek letter.

One variety, which is used for the purpose of removing a tumour from the interior of the nasal cavity, has its end shaped like a khala or mortar, with sharp edges, and of the size of half the stone of the fruit of the jujube tree (*Ziziphus jujuba*)². Vāgbhata³ mentions a similar probe for the purpose of applying actual cautery to a nasal tumour. Its end resembles in shape and size, a half of the stone of the fruit of the jujube tree.

This spoon-shaped probe of the Hindus is comparable to the curette like sharp cyathiscoemele of the Greeks, noted before.

COLLYRIUM PROBES.

For the purpose of applying collyria to the eyes, a rod is mentioned having the length of eight aṅguli and the thickness of a pea. Its both ends are shaped like buds⁴.

The probes for applying collyria to the eyelids, should be six aṅguli long, with a rounded bulbous end. They may be made of gold, or silver, or copper, or iron, or stone. For the habitual use of collyria, a lead probe is prescribed. When medicines are directed

¹ Paul, VI. lxii.

² See foot-note 2, P. 155.

³ कोलास्थि दलं तुल्या स्या नासाश्रीर्बुद्धि दाहकम् ॥

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxv.

⁴ See foot-note 2, P. 155.

to be applied not only to the lids but also to the conjunctiva, the finger is recommended as it is a softer and safer instrument. Again the probes would vary according to the nature of the collyria to be used. As for the application of lekhana collyrium, the probe should be made of copper and should be ten aṅguli long. The probe is advised to be made thinner at its middle to afford a firm grasp by the surgeon. The ends are shaped like buds. For applying ropana collyrium, a similar probe is to be used, but it should be made of steel; while for the application of a collyrium for the improvement of the visual strength, a probe made of gold or silver, and having the size and shape of a finger is recommended by Cakradatta.¹

Suśruta² likes a probe of steel, or bell-metal, or copper for lekhana collyrium; and of gold, or silver, or horn, for ropana and snehana collyria. The probe should be eight aṅguli long, and the eye is to be kept open and fixed by the left hand, while the right hand is to hold the probe, and so the collyrium is to be applied to the eye.

¹ दशाङ्गुला तनुमध्ये शलाका मुकुलानना ॥

प्रशस्ता लिखने ताम्बी रोपणे काललोहजा ।

अङ्गुलीव सुवर्णोत्था रुप्यजा च प्रसादने ॥

Cakradatta. Āschyotana Cikitsā.

² तेषां तुल्यगुणान्येव विदध्याद् भाजनान्यपि ।

सौवर्ण्यं राजतं शार्ङ्गान्नाभं वैदूर्यकांस्यजं ॥

आयसानि च योज्यानि शलाकाश्च यथाक्रमं ।

वक्रयोर्मुकुलाकारा कलाय परिमण्डला ॥

अष्टाङ्गुला तनुमध्ये मुक्ता साधुनिग्रहा ।

औङ्मुख्यश्मजातानि शारीरी वा हिता भवेत् ॥

Suśruta Samhitā. VI. xviii.

Śārṅgadharā¹ says: "The collyrium probe should be made of stone or metal. It should be eight aṅguli long and its ends must be made smooth and rounded like a common pea. For lekhaṇa collyrium, a copper, or iron, or stone probe is to be used, while for ropāṇa collyrium the tip of the finger is recommended for its softness."

Of the probes used by the Hindus for applying collyrium to the eyes, fortunately we possess a few specimens. Among the objects of interest found in the excavations at Bijñor, we find, "fourthly, one copper salai or instrument for applying antimony to the eye, similar to those found in the Bihat excavations."²

¹ मुखयोः कुण्डिता श्लक्षा शलाकाऽङ्गुलीन्मिता ।

अश्लजा धातुजा वा स्यात् कलायपरिमण्डला ॥

ताम्रलोहाश्लसंज्ञाता शलाका लिखने मता ।

सुवर्णरजतोहूता शलाका खेहने मता ।

अङ्गुलीच सटुत्वेन कथिता रोपणे वृधैः ॥

Śārṅgadharā Saṁgraha. III. xiii.

Yogaratanākara. Eye Diseases. P. 823.

त्रिफल सलिलयोगे भृङ्गराजद्रवे च

हविषि च विषकण्ठे क्षीरे अजि मधूगु ।

प्रतिदिनमथ तप्तं सप्तधा सौसमेकं

प्ररिहितमथ पथात् कारयेत् तच्छलाकाम् ॥

सवितुरुदयकाले साधना व्यञ्जना वा

करकरिकसमेतान्क्षपैस्त्रिच्युरोगान् ।

अक्षितक्षित समुत्थान सन्धिवर्षाभिजातान्

हरति नयनरोगान् सेव्यमाना शलाका ।

Cakradatta, Netraroga Cikitsā.

² "Vide Princep's (Thomas') Indian Antiquities, fig. 18. pl. iv" J.A.S.B. IX. 1. 7.

Specillum with two olivary ends formed a variety of probe of the Greek and Roman surgeons. It was used as an ordinary probe in dealing with crooked fistulae, and as a cautery to destroy the roots of hairs after epilation. Sometimes it carried an eye in one of its olives and was used in the treatment of nasal polypus. The eye was threaded with a cord having many knots along it. The other end of the probe was pushed through the nose and withdrawn by the mouth, and then by a sawing movement of the cord with both hands of the surgeon, the polypus was removed.¹ A single probe for the application of semi-solid medicaments, occurs in the outfit of the oculist of Rheims, in the museum at St. Germain-en-Laye and is figured by Milne.²

KARṢA-ŚODHANA OR EAR-CLEANER.

This śālākā is said to have its end shaped like the end of a leaf of Aśvattha (*Ficus religiosa*). The instrument looked like a *sruva*—one of the famous spoons used in sacrificial ceremony.³ It was used for the purpose of extracting wax from the ears.

The different kinds of spoons used in the ancient Hindu ceremonies were as follows: "Three different *sruk* or offering-spoons are used *viz.*, the *guhu*, *upabhrīt* and *drubha*. They are made each of a different kind of wood, of an arm's length (or according to others, a cubit long) with a bowl of the shape and size of the hand, and a hole cut through the bark and front

¹ Paul VI. lxxxvii, VI. xiv, VI. xav.

² Græco-Roman Surgical Instruments, pl. xi, fig. 5.

³ कर्णशोधन मन्त्रस्य पदं प्रान्तं सुवाननं ॥

side of the bowl and fitted with a spout, some eight or nine inches long and shaped like a goose's bill. The *sruva* or dipping-spoon, on the other hand, chiefly used for ladling the clarified butter (or milk) from the butter vessel into the offering-spoons, is of the *khadira* wood (*Accacia catechu*), a cubit long, with a round bowl measuring a thumb's joint across and without a spout".¹

So we see that the bowl of the *karna-śodhana* was round in shape.

Suśruta also mentions a *śalākā* for the extraction of cerumen or minute insects from the ears.² *Cakrapāṇi*³ alludes to it. In modern times, the ear-cleaner, as used commonly in India, is a *tāla yantra*. Ear specillum is frequently mentioned by the Greeks and Romans. It consisted of a small narrow scoop at one end and a simple probe at the other. The use of the scoop is thus described by Archigenes⁴: "If a bean, stone, etc. fall into the ear, remove it with the small narrow scoop of the ear specillum". Celsus⁵ directs us to extract a scab or cerumen by means of the ear specillum.

The ear scoop used by the modern surgeons is a narrow scoop, more like the Hindu *pujā* vessel known as *kuśī*. The ear scoop is often made in combination with a director.

¹ Śatapath-Brāhmaṇa, Sacred Books of the East. 1. 3. 1. 1. foot-note.

² See foot note 1, P. 149

³ क्लेदयित्वा तु तैलेन स्वेदेन प्रविश्यात् च ।

शोधयेत् कर्णगूथस्तु भिषक् सम्यक् शलाकया ॥

Cakradatta, Karna-roga.

⁴ Galen XII, 652.

⁵ Celsus. VI. viii.

GARBHA-ŚĀṆKU. FŒTUS OR TRACTION HOOK.

The end of this instrument is said to have been bent like añkuśa or elephant driver's goad. It is described to have the same length as the other śaṅku have *i. e.* ten to sixteen añguli, and it is eight añguli in width.¹ It is recommended for extracting a dead foetus from the mother's womb, after perforating its head by the maṇḍalāgra or mudrikā knife. Suśruta recommends us to perforate the head and then to extract the bones by the śaṅku or hook, and lastly to apply traction by fixing it about the chest or axilla. If the head can not be perforated, it is to be applied to the eyes or cheeks.²

Traction hook for extraction of a dead foetus was well known to the ancients. Hippocrates³ bids us break up the head of the foetus with a cephalotribe and remove the bones with bone forceps, or deliver it by a traction hook inserted near the clavicle. Celsus⁴ advises us to insert a smooth hook with a short point and to fix it in the eye, or the ear, or the mouth, or the forehead, and so the foetus is to be dragged down. Soranus points out the best places for the insertion of the hook to be the eyes, the occiput, the mouth, the clavicles, and the

¹ नतोऽयं शङ्कुना तुल्यो गर्भं शङ्कुरितिवृत्तः ।

अष्टाङ्गुला यतस्तेन मूढगर्भं हरेत् स्त्रियाः ॥ १६ ।

Aṣṭāṅga Hṛdaya Saṁhitā I. xxv.

² तत्र स्त्रियमाश्रय्य मण्डलाग्रेणाङ्गुलीशस्त्रेण वा शिरोविदार्य शिरःकपालान्याहृत्य शङ्कुना गृहीत्वोऽसि कचायां वापहरेदभिन्ने शिरसि चाक्षिकृते गन्धे वा ।

Suśruta Saṁhitā. IV. xv.

³ Hippocrates. II. 70.

⁴ Celsus. VII. xxix.

ribs in head presentations; and the pubes, ribs, and clavicles in footling cases.¹ Soranus, Aetius² and Paul³ direct us to extract the fœtus in the same way but they recommend us to use two hooks instead of one, in order that the pulling may be straight down and not to one side.

Albucasis,⁴ Rhases,⁵ Haly Abbas,⁶ and Avicenna⁷ give similar directions for opening the child's head and for delivering the fœtus with hooks.

This purpose in modern times is served by the blunt hook and crotchet.

YUJÑA-SĀṆKU OF MIDWIFERY FORCEPS.

An instrument is thus named and figured by modern writers on Hindu surgery, bearing some resemblance to the modern forceps, for extracting the child alive. We have, however, no mention of any such instrument in the works of Caraka, Suśruta Vāgbhata and other ancient authorities. The Greeks and Romans were also ignorant of it; and the Arabians fared no better, though Adams, in his commentary on Paul⁸ asserts that Avicenna refers to forceps for the delivery of living children. Mulder, in his valuable work,⁹ gives an extract from a translation from the works of Avicenna supporting

¹ Soranus. II. xix.

² Aetius. IV. iv. 23.

³ Paul. VI. lxxix.

⁴ Albucasis. Chirrug. II. 76 and 77.

⁵ Rhases. Cont. xxii.

⁶ Haly Abbas. Pract. ix. 57.

⁷ Avicenna. iii. 21, i. 24.

⁸ Paulus. Æginita. III. lxxvi.

⁹ Historia Forcipum et Vecticum. p. 6.

the same conclusion. Smellie¹ says: "With regard to the fillets and forceps, they have been alleged to be late inventions; yet we find Avicenna recommending the use of both. The forceps recommended by Avicenna is plainly intended to save the fœtus". "He recommends all the old methods for assisting in natural labours; and if the woman can not be delivered by these, he orders a fillet to be fixed over the head: if that can not be done, to extract with the *forceps*; and should these fail, to open the skull; by which means the contents will be evacuated, the head diminished, and the fœtus easily delivered."² Playfair³ also holds the same view. The point is however by no means settled. For Milne⁴ says: "A full consideration of Avicenna's words seems to me to lead to the conclusion that he is describing no more than extraction with a craniotomy forceps. If the forceps fail, the child is to be extracted by incision, as in the case of a fœtus already dead (and decomposed so that the forceps would not hold)."

Thus we may be sure that there is no available evidence of the use of delivery forceps by the Hindus, Greeks, Romans and Arabs; and the Chamberlens are still the undisputed claimants to the glory of the invention.

But there is no doubt that the Hindu surgeons tried extraction of the living fœtus by manual traction. The hands are recommended to be well oiled and introduced into the uterus. If the child be dead, sharp instruments are advised to be intro-

¹ Smellie, Treatise on Midwifery, p. 40.

² Ibid, Edited by McClintock. New Syd. Soc, vol. I. Introduction p. 50.

³ Researches on Operative Midwifery, p. 10.

⁴ *æco-Roman Surgical Instruments*, p. 156.

duced into the vagina for cutting upon the fœtus. But on no account such instruments are to be used so long as the child is alive.¹

SARPA-PAṆĀ OR SNAKE'S HOOD.

It is also called *agra-bakra* *i. e.* the end bent. It is a *śaṅku* or hook similar to the above, the end being bent like the hood of a snake.² It is to be used for the purpose of extracting stone after operation.

Suśruta, in the operation for extraction of stone through the perineal incision, directs us to use the *agra-bakra* to bring the entire stone out of the wound. But in the case of females, he recommends us to use a knife having a spoon like a scoop, to prevent the formation of a vesico-vaginal fistula.³ Is it a spoon-shaped knife, or is it a double instrument on a handle—a knife at one end and a scoop at the other? The Greeks used a knife having a scoop at the end.

१ गर्भे जीवति मूढं तु गर्भं यत्ने न निर्हरेत् ।
हस्तेन सर्पिषाक्तेन योनिरन्तर्गतेन सा ॥
मृते तु गर्भे गर्भिण्या योनौ शस्त्रं प्रवेशयेत् ।
शस्त्रशान्धार्यविदूषी लघुहस्ता भयोजिह्वाता ।
सचेतनं तु शस्त्रेण न कथञ्चन दारयेत् ॥

Yogarutnākara, Muḍdhagarva Cikitsā.

२ अयमर्थाहरणं सर्पफणावद्वक्रं अयतः ॥

Aṣṭāṅga Hṛdaya Saṁhitā. I. xxv.

३ यथा च न भियने न चूर्ण्यं ते वा तथा प्रयतेत चूर्णमल्पमप्यवस्थितं हि पुनः परिवृद्धिमेति
तस्मात् समसामश्वक्त्रेणादरीत । स्त्रीषास्तु वलिपार्श्वगतो गर्भाशयः सन्निकटः तस्मान्ना
सामुत्प्लवङ्गस्त्रं पातयेदतोऽन्यथा खल्वासां सूचस्वावी व्रणो भवेत् ।

Suśruta, Saṁhitā. IV. vii.

Celsus¹ describes the extraction of stone through a perineal section by means of the lithotomy scoop. "The scoop is slender at the end and flattened out in the shape of a semi-circle, smooth externally where it comes in contact with the tissue, rough internally where it meets the calculus". It was a long hook-like instrument.

Aetius² mentions a special stone extractor, under the treatment of calculus in the female. Some understand by it the lithotomy forceps.

In modern times we use the lithotomy forceps and scoop for the same purpose.

I take this opportunity of referring to the celebrated passage in the famous Hippocratic oath, which runs as follows: "I will not cut persons labouring under the stone, but will have this to be done by men who are practitioners of this art". This sentence has given a good deal of trouble to the commentators and they have failed to understand the true reasons as to why Hippocrates specially forbade the practice of this operation. "M. Littré finds some difficulty in accounting for the circumstance that the novice in surgery is interdicted from the operation of lithotomy." Adams,³ commenting on the sentence, says: "Why this operation was proscribed, can not indeed be satisfactorily ascertained," and he quotes the Arab Physician, Avenzoar⁴, who "pronounces the operation to be one, which no respectable physician would witness, and far less to perform."

¹ Celsus. vii. xxvii.

² Aetius. IV. iv. 94.

³ The Genuine Works of Hippocrates. Vol. II. P. 777—8.

⁴ Avenzoar. II. 2, 7.

The explanation that this was proscribed because there were men who devoted themselves exclusively to this kind of treatment, and that if the qualified surgeons be allowed to practise the operation, they would interfere in the sphere of action of the lay lithotomists, cannot be considered satisfactory. For the question still remains the open one, why should Hippocrates proscribe this operation from the domains of scientific surgery, simply because a few laymen happened to practise it.

The real explanation is that in Hippocrates' time success in the operation was very difficult to achieve, consequently he interdicted the operation much in the same way as abdominal operations were considered sacred before the days of antiseptic surgery. It is curious to find that Suśruta calls this operation the worst of all surgical operations, for he says¹: "Even experienced and able surgeons fail to attain success by operation for the stone. So the surgical treatment is the worst of all treatment here. But if you do not operate, the patient will die; and it is doubtful whether he will live after the operation; so give him the chance of operation in God's name." I do not know whether this passage of Suśruta has any causal relation to the remarks of Hippocrates, but there is no doubt that the former serves as a better commentary on the latter, than anything hitherto suggested.

Adams² says that this operation was practised by a class of men,

¹ कुशलास्यापि वैद्यस्य यतः सिद्धिरिहान्न वा ।

उपक्रमो जघन्योऽयमतः स परिकीर्तितः ॥

अक्रियायां ध्रुवो सत्यः क्रियायां संशयो भवेत् ।

तस्मादापृच्छ कर्तव्यमीश्वरं साधुकारिणा ॥

Suśruta Samhitā. IV. vii.

² Commentary on Paulus Ægineta. Vol. II. P. 363.

separate from the surgeons, in all countries in ancient times, and points out that the ancient operation of lithotomy is still practised with great success by the native doctors of Hindusthan. No conclusion is, however, to be drawn from the modern practices in India, as we find separate classes of men not only for stone, but also for bone-setting, cataract, etc. And whatever may be the practice in modern times, we find that during Suśruta's time, the operation was not the privilege of the laymen.

ŚARAPUṆKHA-MUKHA PROBE.

This instrument is also described to have its end bent like the hood of a snake. It is four anguli long and is recommended to be used for the purpose of extracting a tooth from its socket.¹

Tooth elevator or instrument for levering teeth is mentioned by Galen.² It is of the same size as the bone lever which, according to Paul,³ is seven or eight anguli long.

This instrument resembles in shape and action the tooth elevator of the modern surgeons.

ARDHACANDRA-MUKHA ŚALĀ. HALF-MOON PROBE.

The first half of this variety of śalā is curved like a half-moon, to which is attached the second half as a rounded handle.⁴ Suśruta advises us to use it for the purpose of applying actual

¹ शरपुङ्खमुखं दन्तपातनं चतुरङ्गुलम् ॥

Aṣṭāṅga Hṛdaya Saṁhitā. I. xxv.

² Galen. xviii. 593.

³ Paulus Ægineta. VI. cvi.

⁴ शलाकामन्त्रवर्त्मनि ।

मध्योर्ध्वं वृत्तदण्डाच्च मूलं चाङ्गुलसन्निभं ॥

Aṣṭāṅga Hṛdaya Saṁhitā I. xxv.

cautery to the groin in bubonecele, to prevent the hernia from entering into the scrotum.¹

A crescent-shaped cautery was also used by the Greek and Roman surgeons. So Paul² says that in cases of sloughing of the prepuce we must cut it off and use lunated cauteries to stop hæmorrhage and prevent the spreading of the wound. Again he mentions a cautery shaped like the Greek letter Γ, in the radical cure of hernia.³

BONE LEVER.

Instruments for levering fractured bones into their proper positions are mentioned several times by Suśruta. In the treatment of fracture of the nasal bones, a śalākā is recommended to be used as a bone lever for raising and depressing the fractured ends.⁴ Sometime a muśala or pestle is advised to be used.⁵ It is a thick wooden pestle the end of which is plaited with iron. It is still used to strike upon paddy to separate the husk from the rice. Suśruta mentions its use to reduce dislocations of the joints of the shoulder and neck.⁶

¹ तव या वङ्गणस्या ताः दहेदृद्धन्दुवक्रया ।

सम्यग्मागार्वावरोधार्थं कोशप्राप्तां तु वर्जयेत् ॥

Suśruta Saṁhitā, IV. xix.

² Paulus Aegineta. VI. lvii.

³ Ibid. VI. lxx.

⁴ नासां सन्नां विवृतां वा ऋज्वीं कृत्वा शलाकया ।

Suśruta Saṁhitā, IV. iii.

⁵ सन्नसन्नमयत् खिन्नमचकम् मूषलेण तु ।

तथोन्नतं पीडयेच्च वघ्नीयाद्वादमेव च ॥

Ibid.

⁶ तैलपूष्ण कटाहे वा द्रोण्यां वा शाययेन्नरं ॥

मूषलेनोत्क्षिपेत् कवामांससम्भौ विसृजते ।

स्थानास्थितश्च वघ्नीत खस्तिकेन विचक्षणः ॥

Ibid.

The pestle was also used by Hippocrates¹ to reduce dislocation of the shoulder joint. He says : "Those who accomplish the reduction forcibly bending it round a pestle, operate in a manner which is natural. But the pestle should be wrapped in a soft shawl (for thus it will be less slippery), and it should be forced between the ribs and the head of the humerus. And if the pestle be short, the patient should be seated upon something, so that his arm can with difficulty pass above the pestle. But for the most part the pestle should be longer, so that the patient when standing may be almost suspended upon the piece of wood. And then the arm and forearm should be stretched along the pestle, whilst some person secures the opposite side of the body by throwing his arms round the neck, near the clavicle"

The bone lever used by the Greeks is thus described by Paul :² "It is an instrument of steel about seven or eight fingers' breadth in length, of moderate thickness that it may not bend during the operation, with its extremity sharp, broad and somewhat curved."

DIRECTOR.

Suśruta³ mentions the use of eṣaṇī or metallic probes not only to ascertain the course of the fistulous track but also to raise the bridge of skin covering the sinuses, so that the surgeon may operate on it as a guide. Cakradatta⁴ also uses a probe to

¹ The Genuine Works of Hippocrates. Adams' Trans. p. 372.

² Paulus Ægineta, Vi. cvi.

³ .पक्केषु चोपस्निग्धमवगाहस्विन्नं शय्यायां सन्निवेश्यार्शसन्निव यन्मथित्वा भगन्दरं समीच्या पराचीनमवाचीनं वा वह्निर्मुखमन्तर्मुखं वा ततः प्रणिधायैषणीमुन्नम्य साशयसुदुरेच्छस्तेषु
Suśruta Samhitā, IV. viii.

⁴ नाडीनां गनिसन्विध्य शस्त्रेनापाठ्य कर्मवित्।

Cakradatta, Nādivraṇa Cikitsā.

learn the direction of the wound before operation. It is also mentioned in the *Yogaratanākara*.¹

In the treatment of fistulae, Celsus² also says: "A director being inserted into them down to their termination, the skin ought to be incised." It is not mentioned that the *esaṇī* or probe was grooved, but there is no doubt of its use like a grooved director, so common nowadays. The discovery of such a director, along with several other surgical instruments, which are preserved in the *Musée de Cinquantenaire*, Brussels, proves that it was known to the Romans.

URETHRAL PROBE.

A variety of *śalākā* is described by *Suśruta*³ to have its end rounded like the stalk of a *mālātī* flower (*Echites caryophyllata*, Rox.) It is to be used for cleaning the urethral canal.

*Caraka*⁴ mentions a probe for examining the direction of the urethral canal and its pathological condition, before introducing the tube of the urethral or bladder clysters into it.

¹ नाडीनां गतिमन्वीक्ष्य शस्त्रेणोत्पाद्य कर्मावित् ।

Yogaratanākara, p. 346.

² Celsus, VII. iv.

Græco-Roman Surgical Instruments, p. 73.

³ सुवसार्गविशोधनाय एकं मालनीपुष्पवन्तायप्रमाणं परिसङ्कलमिति ।

Suśruta Saṁhitā, I. vii.

⁴ ऋजोः सुखोपविष्टस्य हृष्टं मेद्रे घृताविति ।

शलाकयान्निष्य गतिं यद्यप्रतिहता व्रजित् ॥

ततः शिफःप्रमाणेन पुष्पनेत्रं प्रवेशयेत् ॥

Caraka Saṁhitā, VIII. ix.

Class VI. The Upayantra or Accessory Instruments.

The sixth class of the blunt instruments comprises the upayantra or accessory instruments. By surgical instruments, the Hindus consider not only the instruments proper, but also any mechanical aid by which the object of the surgical treatment is attained. Thus even medicinal agents are considered under this head for they help the inflammatory swellings to subside, or suppurate, or burst open as by various external applications. The accessory instruments are :

1. RAJJE OR THREAD.

As an example of thread being used as an instrument of surgery, we know that the thread smeared with caustics are recommended by Suśruta¹—kṣāra sūtra or caustic thread—for the operation of fistula-in-ano. For further informations on the subject see “Eṣanī or sharp probes” under the Śastra.

Thread as a material of phalavartī or tent is mentioned by Śārṅgadharma.² If after a vaginal or intra-uterine douche, the injection does not flow out, he advises us to introduce a strong tent made of thread, dipped in oleaginous medicines of the

¹ कृशदुर्बलभौकणां नाडीमर्म्भयिताच्च या ।

चारसूत्रेण किन्त्यान्नत् शस्त्रेण बुद्धिसान् ॥

Suśruta Samhitā, IV, xvii.

Cakradatta, Nāḍivraṇa Cikitsā.

² फलवर्त्तिं निदध्याद्वा योनिमार्गे दृढं भिषक् ।

सूत्रैर्विनर्मितां सिग्धां शोषनद्रव्यसंयुताम् ॥

Śārṅgadharma Saṁgraha, III. vii

sodhana (Purifier) group. Cakradatta¹ uses caustic threads in the treatment of piles by ligature.

2. VĒṢIKĀ OR TWINE.

The use of twine as a ligature to be applied above the part bitten by a snake to arrest the circulation of blood towards the heart is mentioned by Suśruta.² Caraka³ also advises us to tie ligatures above and below the bitten part, then to squeeze out the poison towards the wound, whence it is to be drawn out through incisions made by a knife.

3. PĀṬĀ OR BANDAGES.

For the proper application of bandages, Suśruta mentions the following materials to be necessary :⁴ *viz.*, cloth manufactured

¹ भावितं रज्ज्वनीचूर्णैः क्षुहीचीरे पुनःपुनः ।

बन्धनात् सुदृढं सूत्रं भिनत्ताशीं भगन्दरं ॥

Cakradatta, Arśaroga Cikitsā.

² सा तु रज्वादिभिर्वद्धा विषप्रतिकरीमता ।

Suśruta Saṁhitā, V. v.

³ दंशात् तु विषं दष्टस्य विस्तृतं वेणिकां भिषक् बद्धा ।

निष्पीडयेद्भृशं दंशमुद्धरेन्मर्म्भं वर्ज्जम् ॥

Caraka Saṁhitā, VI. xxv.

⁴ अत ऊर्ध्वं व्रणवन्धनं द्रव्याण्युपदेक्षामः । तद्यथा चौमकार्पासविकदुक्तल कौशेयः पत्रोर्ण चीनपट्टचर्मामन्तर्वल्कलालावूशकाललता विदलरज्जुतुलफलसन्तानिका लौहानीति तेषां व्याधि कालं चावेक्ष्योपयोगः प्रकरणतश्चैषामादेशः । तत्र कोशदामखलिकानूवेक्षितप्रतोक्षी-मण्डलस्थगिकाक्षमकखट्वाचीनविवन्धितानगोफणाः पञ्चाङ्गी चेति चतुर्दशवन्धविशेषाः ।

तेषां नामभिर्विकृततयः प्रायेणव्याख्याताः । तत्रकोशमण्डुष्ठाङ्गुलिपर्वसु विदध्यात् । दाम सन्धाधेऽङ्गे । सन्धिक्षूर्ध्वकभूस्तान्तरतलकर्णेषु खलिकां । अनुवेक्षितानु शाखामु, । यौवामेद्रयोः प्रतोक्षा । वृत्तेऽङ्गे मण्डलं । अङ्गुष्ठाङ्गुलिमिद्वारेषु स्थगिकां । यमलव्रणयो र्यमकं । हनुशङ्खगण्डेषु खट्वां । अपाङ्गयोर्ध्वीनं । वृष्टदरोरःसु विवन्धं । सूक्ष्मिणि वितानां चित्तकनासीष्ठां सबन्धितु गोफणां । जटुणऊर्ध्वं पञ्चाङ्गीमिति । यो वा यस्मिन् शरीरं प्रदेशे सुविबिष्टो भवति तं तस्मिन् विदध्यात् ।

Suśruta Saṁhitā, I. xviii.

from the fibres of plants, flax, cotton, wool, blankets, silk, leather, Chinese cloth, inner barks of trees, bark of bottle gourd (*Cucurbita lagenaria*), tendrils of twining plants, cane or pieces of split bamboo, rope, fruits as those of *Bombax Malabaricum*, blades of knives, and plates of metals as gold, or lead, or iron. These articles should be used with due consideration as regards the nature of the disease, the time of their use and the purpose in hand. He describes fourteen varieties of bandages as follows:—

1. *Kośa* :— a hollow cylinder or sheath to be applied to the joints of the thumb and fingers. This form of bandage is to be applied over the stumps after amputation of the limbs.

2. *Dāma* (*i.e.* tail of a quadruped ?) :— it is a large bandage to be tied round a part for the relief of pain or cramps.

3. *Svastica* or a circular cross-bandage:— it is to be applied round the joints, the space between the tendons of the great and second toes, the intermammary region, the glabella (space between the eyebrows), the plantar surfaces of the feet, the palmer surfaces of the hands, and the ears. It is also the form of bandage recommended in dislocations of the shoulder joint.

4. *Anuvellita* or an encircling bandage :—it is to be applied to the limbs. This form of bandage is recommended to be applied to the limbs in cases of oblique, deep, and large cuts inflicted by a knife. A leather bandage applied in the form of *gophaṇā* would also serve the purpose. The encircling bandage is also advised in cases of fracture of the ribs.

5. *Protolī* :— a broad bandage for the neck and penis.

6. *Maṇḍala* or a circular bandage :— it is to be applied to

the round parts of the body such as the arms, sides, abdomen, thighs, and back.

7. *Sthagikā* or a supporter :— a bandage enclosing a splint and pastes of medicaments to keep the parts firm. It is to be applied over the ends of the thumb, fingers, and penis. *Suśruta* directs us to use this bandage round the scrotum after tapping the hydrocele.

8. *Yamaka* or a double-bandage :— a pair of circular bandages applied to a couple of ulcers on a part.

9. *Khatvā* or a four-tailed bandage :— it is recommended for the temples, cheeks and lower jaw.

10. *Chīna* or a banner bandage :— a bandage for the inner angles of the eyes.

11. *Vivandhana* or a circular chest-bandage :— it is the bandage for the back, abdomen and chest.

12. *Vitāna* or a canopy bandage :— a large bandage for the head.

13. *Gophaṇā*¹ (*lit.* a sling for throwing stones) :— a concave bandage for the chin, nose, lips, shoulders and pelvis.

¹ शाखासु प्रतितां स्मिथ्यक् प्रहारास्त्रिव्रतान् भृशं ।

सीयेत् सन्यधिविधाय सन्यस्थीन्यनुपृच्छः ॥

वज्रा वेज्जितकेनाश ततस्मैलेन सेचयेत् ।

चर्मणा गोफणावन्धः कार्यो यो वा हितो भवेत् ॥

Suśruta Samhitā, IV. ii.

पादौ निरस्तमुपस्य जलेन प्रोक्षा चाग्निशी ।

प्रवेश्य त्वमिव न्या मुक्चौ सीवित्ततः परं ॥

कार्यो गोफणिकावन्धः कच्छासाविश्व यन्त्रकं ॥

14. *Pañcāṅgī* or a five-tailed bandage¹ :— it is intended for the parts above the clavicle, as in the dislocations of the lower jaw. *Caraka*² mentions a bandage called *kavalikā*, to be tied tightly after setting a fracture or reducing a dislocation. It is so-called from the medicinal paste which is applied to the affected parts, underneath the splints.

Dunglison mentions a bandage called *Accipitar* to be applied over the nose. It is so called from its likeness to the claws of a hawk. It resembles the *pañcāṅgī* bandage of the Hindus.

So the bandages are recommended to vary according to the different parts of the body ; and the surgeon, using his discretion, is to select the form of bandage suitable to the part. The bandages are recommended to be firmly secured to their place by three strings, applied upwards, downwards and obliquely. The knot is avoided over the seat of ulcer and tied on a side.

Suśruta says : “Bandages are applied with three degrees of tightness according to the seat of the abscess :—
1. A tight bandage causes uneasiness but not actual pain ;
2. A loose bandage is loose and relaxed ; 3. An even bandage is properly applied—neither tight nor loose. The tight bandage is to be applied to the buttocks, sides of the abdomen, axilla, groin, chest and head. The eyes and joints

¹ हन्वस्थिनी समानीय हनुसन्धौ विसंहते ।

स्व दधित्वा स्थिते सम्यक् पञ्चाङ्गां वितरेद्विषक् ॥

Suśruta Samhitā, IV. iii.

² अस्थिभग्नं च्युतं सन्धिं संदधीत समं पूनः ।

समेन सममङ्गेन कृत्वान्येन विचक्षणः ॥

स्थिरैः कवलिकावन्धैः कुशिकाभिश्च संस्थितम् ।

पटैः प्रभूत सर्पिष्कैर्वधीयादवलं सुखं ॥

Caraka Samhitā, VI. xiii.

are loosely bandaged. The even bandage is for the extremities, face, ears, neck, penis, scrotum, back, sides, and abdomen."¹

Suśruta next deals with the alterations in the mode of applying bandages according to the rules laid down. He also advises the surgeon to be guided by the dictates of his common sense. He directs us to practise bandaging on the various large and small limbs of a human figure made of cloth or clay.²

With regard to the mode of application of bandages, Hippocrates says :³ "It should be done quickly, without pain, with ease and with elegance, it should fit well and neatly. The forms of it are the simple, the slightly winding (called *ascia*), the sloping (*sima*), the monocus, the rhombus, and semi-rhombus".

The whole chapter of Suśruta is very interesting and will repay perusal. If bodily transferred, it will adorn any modern text book on surgery.

As it is very difficult to convey a correct idea of these bandages in words, I have given figures of them from modern works on surgery, from which their construction and uses will be readily understood at a glance.

¹ तत्र व्रणायतनविशेषादन्ध विशेषस्त्रिविधो भवति गाढः समः शिथिल इति ।

पीड्यन्नरुजो गाढः सोच्छ्रासः शिथिलः स्मृतः ।

नैव गाढो न शिथिलः समोऽन्धः प्रकीर्तितः ।

तत्र स्त्रिक् कुक्षि कक्षावङ्गणोरः शिरः सुगाढः । शाखावदन कर्णकण्ठनेत्रमुष्कपृष्ठपार्श्वो-
दरसु समः । अक्षोः समिधु च शिथिल इति ।

Suśruta Samhitā, I. xviii.

² पुस्तकय पुरुषाङ्ग प्रत्यङ्गविशेषेषु वस्त्ययोग्यं ।

Ibid, I. ix.

³ The Genuine Works of Hippocrates, Vol. II, P. 477. Syd. Soc. Ed.

ABDOMINAL BINDER.

Caraka¹ mentions the use of abdominal binder for the recently delivered woman to prevent derangement of air by its expansion in her abdomen.

Dr. Barnes says:² "The sudden expulsion of one-tenth of the body-weight from the abdominal cavity is attended by a sudden removal of a force hitherto pressing upon the vessels and organs of the chest, abdomen, and pelvis. This entails in some cases a tendency to vacuum. Hence disturbance of the circulation. Now the binder, by supporting the abdominal walls, restores the equilibrium of pressure. The pressure exerted upon the uterus works as a gentle continuous stimulus to contraction. The woman is conscious of the support and is grateful for it. . . . The figure, so precious, and rightly so, to women, is better preserved . . . So applied, the binder becomes one of the most efficient agents in antiseptic midwifery; it keeps the walls of the uterus and vagina in contact, thus preventing the collection of fluids or clots, and shutting out air".

The use of cloth for other surgical purposes is also mentioned:—

FIELD HOSPITAL.

The cloth is to be used for the manufacture of tents for the doctors to live in. The wounded in war are to be treated in such tents. The tent of the surgeon-general should be close to that of the king in the battle-field.³

¹ वेष्टयेद्दरं सहता वाससा तथा तस्या न वायुरुदरे विक्रितिसुत्यादयन्वनवकाशत्वात् ।

Caraka Samhitā, IV. viii.

² Obstetric Medicine and Surgery, Vol. II. p. 87.

³ क्लृप्तावारि च सहति राजगैहादनन्तरं ।

भवेत् सन्निहितो वैद्यः सर्वोपकरणान्वितः ॥

Small tents are also recommended for applying vapour bath to patients.

DRESSINGS.

Diḍhavaḷa¹ mentions the use of medicated gauzes to be used as sponge by the females and says : “In discharges from the vagina, pieces of cloth soaked in decoction of barks of Vata (*Ficus Bengalensis*) and Lodha (*Symplocos racemosa*) and dried, should be put inside the canal.”

In the Mohāvāgga² we find the use of itch-cloth :—
“I allow, O Bhikkhus, to whomsoever has the itch, or boils, or a discharge, or scabs, the use of an itch-cloth”.

“According to the 90th Pakittiya such cloth must not be more than four spans in length and two in breadth.”

I can not help quoting from Mohāvāgga,³ another discourse of Buddha as it shows clearly the surgical treatment of boils in ancient times :—

Now at that time a certain Bhikkhu had boils.

“I allow, O Bhikkhus, the use of the lancet”.

Decoctions of astringent herbs were required.

“I allow, O Bhikkhus, decoctions of astringent herbs”.

Sesamum salve was required.

तदस्थिमनं ध्वजवद्यमः ख्यातिं समुच्छ्रितं ।

उपसर्पन्त्यभोहेन विषगन्ध्यामयद्दिताः ॥

Suśruta Saṁhitā, I. xxxiv.

¹ न्ययोधत्वञ्च कषायिण लोघ्नकत्वं तथा पिवेत् ।

आस्रविर्चासपट्टं वा भावितं तेऽनुधारयेत् ॥

Caraka Saṁhitā, VI. xxx.

² Mahāvāgga, VIII. 17, 2.

³ Ibid. VI. 14, 4 & 5.

“I allow, O Bhikkhus, the use of sesamum salve”.

5. Compresses were required.

“I allow, O Bhikkhus, the use of compresses.”

It was necessary to tie up the sore with cloth.

“I allow, O Bhikkhus, the use of bandages for tying up wounds”.

The sore itched.

“I allow you, O Bhikkhus, the sprinkling of a sore with mustard-powder”.

The sore became moist.

“I allow you, Bhikkhus, to fumigate (the sore).”

Proud flesh formed on the wound.

“I allow you, O Bhikkhus, to cut off (proud flesh) with a lancet”.

The wound would not close up.

“I allow, O Bhikkhus, the use of oil for wounds”.

The oil ran over.

They told this thing to the Blessed One.

“I allow, O Bhikkhus, the use of fine rags, and of all kinds of ways of treating wounds”.

If the object of fumigating the sore was to sterilize it, as it certainly was, we may take this dialogue as the best sketch of the scientific treatment of boils,—remembering that it represents the knowledge of surgery more than 2500 years ago.

Cakrapāṇi advises us to tie the ends of the hairs of a patient, by a piece of cloth,¹ before performing phlebotomy on the vessels of the head and neck.

¹ मृदुपट्टात्तकेशान्नी जानुस्थार्पितकर्परः ।

I. CARMA OR LEATHER.

The use of leather in ancient medical practice in India was manifold.

Leather bandage.

Straps or belts of leather were used as bandages. Suśruta¹ advises us to apply the leather bandage in cases where more than half the thickness of the upper or lower extremities are cut by some sharp instruments in a slanting direction. Then the parts of the wound should be well adjusted, the bone and the soft parts kept in apposition, and the wound closed by sutures and well covered by dressings, over which the leather bandage is to be applied in the form of a gophayā or sling.

Leather bandage in the form of gophayā is mentioned by Suśruta² to be applied over the anus to prevent recurrence of pro-cidentia of the rectum. The prolapsed bowl should be well bathed with ghee and fomented; and then reduced by gentle pressure. There should be a hole in the bandage just in front of the anus to allow flatus to pass out. Vṛnda³ alludes to it. Similarly the modern surgeons use a pad supported by a bandage as an aid in

¹ See foot-note 1, P. 178.

" गुदभेदं गुदं स्विन्नं स्नेहाभ्यक्तं प्रवेशयेत् ।
कारयेद्गोफणाऽथ सञ्चिच्छिद्रेण चर्मणा ॥

Suśruta Samhitā, IV. xx.

³ गुदभेदं गुदं स्नेहैरभ्यज्याऽथ प्रवेशयेत् ।
प्रविष्टं स्नेदयेत्तपि वह्नौ गोः फणया भ्रूणम् ॥

गोः फणयेति । गोः फणा वस्त्रविशेषः ।

उक्तं हिः—उच्चारनिर्गमाथ सच्छिद्रेण चर्मणा चास्य गोः फणावन्धः कार्य इति ॥

Vṛdamādhava or Siddhayoga, Ch. 57.

preventing descent of the gut. It is mentioned also in the Cakradatta¹ and the Yogaratnākara.²

Dr̥dhavala mentions the use of a piece of untanned leather to be applied over a layer of ointment during the day, while during the night the leaf of Eraṇḍa (*Ricinus communis*) is directed to be used.³

LEATHER LIGATURES.

In the treatment of snake-bite, a ligature is advised to be used above the seat of injury to stop the circulation of poisoned blood. This ligature is advised to be made of leather, or braided fibres of trees, or soft cord of jute, etc.⁴

YANTRA-ŚĀṬAKA. LITHIOTOMY STRAP OR BINDING APPARATUS.

This is the name of the leather shackle, which is recommended to be used during the operation for stone in the bladder. The patient should flex his knees and elbows; and the parts are to be

¹ गुदभंशे गुदं स्नेहैरभ्यज्याऽऽयुः प्रवेशयेत् ।

प्रविष्टे स्वेदशेषाणि वद्धं गोः फणया दृढम् ॥

Cakradatta, Kṣudraroga Cikitsā.

² गुदभंशे गुदं स्निग्धं स्नेहेनाक्तं प्रवेशयेत् ।

प्रविष्टं रोधयेद्यद्वाद्रव्यसंच्छिद्रं चर्मणा ॥

Yogaratanākara, P. 343.

³ एरण्डपत्रैः प्रच्छाद्य रातौ कथं विमोचयेत् ॥

चीराम्बुणा ततः सिक्तं पुनश्चैवोपनाहितम् ।

सुखेद्रात्रौ दिवावद्धं चर्मभिः सुलोमभिः ॥ ८४ ।

Caraka Saṁhitā, VI. xxviii.

⁴ सर्व्वैरेवादितः सर्पः शाखादण्डस्य देहिनः ।

दंशस्थोपरि वध्नीयादरिष्टाश्चतुराङ्गुली ॥

प्रोतचर्मोन्त-वल्कानां मृदुनायतमेन च ।

न गच्छति विषं देहमरिष्टाभिर्निवारितं ॥

Suśrūta Saṁhitā, V. v

tied together by this instrument.¹ Similarly, it is to be used during the operation for piles; but then, according to Suśruta,² the neck and thighs are to be tied by the instrument which is to be held firmly by the assistants. Vāgbhaṭa³ uses cloth instead of leather.

Yantra-sāṭaka is also to be used during the operation of phlebotomy. Suśruta says⁴: "If venesection is required to be done, the patient is to be seated on a stool, an aratni high (from the elbow to the end of the little finger), facing towards the sun. The thighs are to be flexed, the two elbows to be placed over the knees, and the hands (the fingers being clenched into fists) to be fixed on the two sides of the neck. The two ends of the shackle which pass over the fists, are held up at his back by the left hand of an assistant, who with his right hand steadily (neither forcibly nor loosely) presses above the part selected, to make the veins prominent, and at the same time rubs on the back to

¹ सङ्कुचितजानुकर्परमितरेण सहाववद्धं मूलेण शाटकैर्वा ।

Suśruta Saṁhitā, IV. vii.

² वस्तकस्त्रलकोपविष्टं यन्त्रशाटकेन परिचितं शीवासकथं परिकम्भिभिः सुपरिगृहीतमस्यन्दनशरीरं कृत्वा ।

Ibid, IV. vi.

³ अथ यन्त्रेण वाससा ।

सकथौ शिरोधरायाश्च परिचितं सज्जस्थितम् ॥

Aṣṭāṅga Hṛdaya Saṁhitā, IV. viii.

⁴ तव व्यथ्यसिरं पुरुषं प्रत्यादित्यमुखमरन्निमाचोक्लिने उपवेश्यासने सकथौराकुचितयोर्निवेश्य कर्परसन्निहयस्योपरि हस्तावल्गूदाङ्गुष्ठकृतमुष्ठी मन्ययोः स्थापयित्वा यन्त्रणशाटकं शीवासुथ्योरुपरि परिविचित्रान्येन पुरुषेण पश्चात्स्थितेन वामहस्तेनोत्तानेन शाटकान्तर्द्वयं ग्राहयित्वा ततो वैद्यो ब्रूयाद्बिषहस्तंन सिरौत्यापनायं नात्याश्रयश्रियलं यन्त्रमावेष्टयेत्यसृक्स्त्रावणाथ यन्त्रं पृष्ठमध्ये च पोडयेति कर्मगुरुवच्च वायुपूर्णमुखं स्थापयेद्देव उत्तमाङ्गगतानामन्तर्मुखवन्धनं सिरायां व्यधेन यन्त्रणविधिः ।

stimulate bleeding, the patient being then told to inflate his mouth with air forcibly. This is the method of binding for puncturing the veins of the head except those (veins) which have their mouths turned inside the body". Vāgbhaṭa describes a similar procedure in bleeding from the vessels of the neck¹.

The Greeks also used ligatures to tie up the arms and legs of a patient in the lithotomy position. Paul² says: "In operating, the woman should be placed on a seat in a supine posture, having her legs drawn up to the belly, and her thighs separated from one another. Let the arms likewise be brought down to her legs and secured by proper ligatures about the neck".

In modern times, similarly, we use lithotomy straps or crutch, after placing the patient in the lithotomy position during the operation of lithotomy and excision of piles.

PĀŚA.

This is a different shackle to be used for binding insane persons.³

¹ अग्नितापातपक्षिण्यो जानूश्चासन संस्थितः ।

हृदपट्टाक्तकेशान्तो जानुस्थापित कूर्परः ॥

मुष्टिभ्यां वस्त्र गर्भाभ्यां मन्थे गाढं निपीडयेत् ॥

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxvii.

² Paul. VI. lxxiii.

³ भौमाकारैर्नरैर्नागैर्दान्तैर्व्यालैश्च निर्व्विषैः ॥

भौषयेत् सततं पाशैः कशाभिर्व्वाथ ताडयेत् ।

यन्मथित्वा सुषुप्तं वा चासयेत् दद्याद्भिना ।

Suśruta Saṁhitā, VI. lxxii.

ABDOMINAL BINDER.

The use of cloth binder has been described before¹. Leather binder is to be used after the operation of paracentesis abdominis to apply pressure over the abdomen. After draining the fluid of ascites, the abdomen of the patient should be well wrapped with blankets, or silk cloth, or leather binder, for then the abdomen would not be flatulently distended by air.²

LEATHER BAGS.

The use of leather in the formation of bags of the vasti-yantra has been described before³.

ŚĪRO-VASTI. LEATHER BAG FOR THE HEAD.

For application of oil on the head, Suśruta⁴ directs us to use a goat's bladder filled with medicated oil, just in the same way as ice bags are used nowadays.

Śārṅgadharma⁵ describes another variety of śīro-vasti: "It is

¹ See P. 181.

² निःसृते च दोषे गादतरमाविक काशेय चर्मणामस्थतमेन परिवेष्टयेदुदरं तथा नाभापयति वायुः ॥

Suśruta Samhitā, IV. xiv.

³ See P. 129-30.

⁴ अज्वासीनस्य वझीयाद वस्तिकोषं ततो दृढं ।

Ibid, VI. xviii.

⁵ शिरोवस्तिविधिश्चात्र प्रोच्यते सुश्रसम्मतः ।

शिरोवस्तिचर्मणः स्याद्विसृखो द्वादशाङ्गुलः ॥

शिरःप्रमाणं तं वङ्गा मस्तके माषपिष्टकैः ॥

सन्निरोधन्विधायादीं स्नेहैः कोणैः प्रपूरयेत् ॥

तावत् धार्यस्य यावत् स्यान्नासनेन सुखस्रुतिः ।

वेदनोपशमो वापि मादराणां वा सहस्रकम् ॥

Śārṅgadharma Saṅgraha, III. xi.

made of leather, has a length of twelve aṅguli and has two orifices or mouths. The leather bag is to be well tied round the head, the junction of the circumference of the bag and the skin should be well pasted with māṣa (Phaseolus Rox) glue. Then the cavity thus formed is to be filled with hot oily medicine. This is to be retained until the headache is relieved." Cakra-datta¹ also mentions it. The bag is described to be sixteen aṅguli high in the Yogaratnākara². Vāgbhaṭa³ advises us to use leather of a cow or buffalo, and it is said to have been twelve aṅguli broad.

LEATHER BAND.

In phlebotomy, a band is advised to be applied above the spot where the vein is to be punctured. This band is recommended to be made of cloth, or jute, or leather, or barks of

¹ आशिरो व्यायतं चर्मं कृत्वाष्टाङ्गुलमुच्छ्रितम् ॥

तेनावेद्य शिरोऽधस्तान्माषकल्केन लेपयेत् ।

निश्चलस्योपविष्टस्य तैलेकृण्वैः प्रपूरयेत् ॥

Cakradatta, Śiro-roga Cikitsā.

² आशिरो वापितचर्मं षोडशाङ्गुलमुच्छ्रितम् ।

तेनावेद्य शिरोऽधस्तान्माषकल्केन लेपयेत् ॥

Yogarātṇākara, P. 402.

³ विधिलस्य निषण्णस्य पीठे जानुसमे श्चदौ ।

शृङ्गाक्षिन्नदेहस्य दिनान्ते गव्यमाह्वयम् ॥

द्वादशाङ्गुलविक्षीर्णं चर्मपट्टं शिरः समम् ।

आकर्णं बन्धनं स्थानं ललाटे वस्त्रं वेष्टिते ।

चैलवेणिकया बद्धा माषकल्केन लेपयेत् ॥

ततो यथाव्याधि श्रुतं केहं कोणं निषेचयेत् ।

ऊर्ध्वं केशभ्रूवो यावद्द्व्यङ्गुलं धारयेच्च तम् ॥

Aṣṭāṅga Hṛdaya Sarāhitā, I. xxii.

trees, or tendrils of twining plants¹; and it should not be applied either too tight or too loose. As for example, in phlebotomy in the foot, the yantra-śāṭaka or ligature should be applied below the knee-joint, while the band is to be tied round, at a distance of four aṅguli above the part selected for the operation.² Vāgbhata³ says: "In phlebotomy, a band is to be tied round the upper extremity, four aṅguli above the spot selected for opening the vein which is to be made prominent by pressing it upwards with the closed fist." Cakradatta⁴ also quotes it. Vāgbhata⁵ recommends us to use a cloth band to be tied round the leg, four aṅguli above the spot selected for opening the vein in the leg.

This band corresponds to the band of Antyllus used by the Greeks. Antyllus applies a ligature of two fingers'

¹ गावं वहोपरि दृढं रज्ज्वा पट्टेन वा समम् ।

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxvi.

वक्षपङ्चवर्णान्व्यक्कललतानामन्यतमेन यन्मयित्वा नातिगाढं नातिशथिलं शरीरं प्रदेशमासाद्य यथोक्तं शस्त्रं गृहीत्वा सिरां विधेत् ॥

Suśruta Saṁhitā, III. viii.

² तत्र पादव्यध्यसिरस्य पादं समेस्थाने सुस्थिरं स्थापयित्वा पादमीषत्सङ्कुचितमुच्चैः कृत्वा व्यध्यपादं जानुसन्धेरधः शटकेनावध्य हस्ताभ्यां प्रपीड्य गुल्फं व्यध्यप्रदेशस्योपरि चतुरङ्गुलम् श्रोतदीनामन्यतमेन वद्धां पादासिरां विधेत् ॥

Ibid.

³ विध्येकसिरां वा पादवनाकुक्षितं कूर्परे ।

वद्धा सुखोपविष्टस्य सुष्टिमङ्गुष्ठ गर्भिणीम् ।

ऊर्ध्वं वेध्यप्रदेशाच्च षट्ठिकां चतुरङ्गुले ॥

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxvii.

⁴ Cakradatta, Sira-vyādhādhikāra.

⁵ पादे तु सुस्थितेऽधस्ताज्जानु सन्धेर्निर्णीयते ।

गाढं कराभ्यामागुल्फं चरणे तस्य चोपरि ॥

द्वितीये कुक्षिते किञ्चिदाहृदे हस्तवत्ततः ।

वद्धा विध्येत् सिरामित्यमनुक्तेष्वपि कल्पयेत् ॥

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxvii.

breadth round the arm in bleeding at the elbow, while to bleed at the ankle, the band is to be applied at the knee. It is mentioned as fillet in the pseudo-Hippocratic treatise on Ulcers;¹ and Oribasius² gives an interesting dissertation on the subject, principally condensed from the works of Herodotus, Antyllus and Galen. Paul³ also ties a narrow band round some muscular part of the arm before abstracting blood from the inner part of the elbow. "Wherefore we must tie a narrow band around some muscular part of the arm, and having by friction of the hands upon one another produced the necessary fulness of the vein, we divide it transversely, but only along its breadth."

LEATHER BOTTLES, JARS, MAṢAKA, etc.

Leather was used in the manufacture of bottles and jars. Leather maṣaka for honey, Soma juice, and dadhi (curdled milk), is mentioned in the R̥gveda⁴ and also in the Laws of Manu where

¹ Ulcers, iii. 328.

² Med. Collect., vii, Phlebotomy.

³ Paulus Ægineta, Adam's Trans. Bk. VI. Sec. XL.

⁴ इतेरिव तेऽहकमस्तु सख्यं ।

अखिद्रस्य दधन्तः सुपूर्यस्य दधन्तः ॥

R̥gveda, 6 M. 48 S. 4 A. 8 Ch. 18 v.

यो ह वां सधुनो दितिराहितो रथचर्षणे ।

ततः पिबतमग्निना ॥

Ibid, 8 M. 5 S. 5 A. 8 Ch. 19 v.

उखिष्टं चम्बोर्भैर सोमं पवित्र आ सृज ।

नि चेद्दि गोरधि त्वचि ॥

Ibid, 1 M. 28 S. 1 A. 2 Ch. 9 v.

एष सोमो अचि त्वचि गवां क्रौडत्यद्रिभिः ।

इन्द्रं मदाय जीह्वयत् ॥

Ibid, 9 M. 66 S. 7 A. 2 Ch. 29 v.

it is called *drti*¹. Leather *maṣaka* or inflated skins were in use as swimming bladders, and we have a representation of "figures with garlands in their hands, swimming and disporting themselves, supported on *maṣaks* or inflated skins."² In the *Rgveda*, Agastya in his spell to neutralise poison, says:³ "I deposit the poison in the solar orb, like a leather bottle in the house of a vendor of spirits."⁴ Dr. Mitra points out that "other *smṛtis* ordain that oleaginous articles preserved in leather bottles do not become impure by the contact of the impure cowhide ; and in the present day, jars of that material are in extensive use in Bengal and the North-West Provinces for the storage of oil and ghee. In the latter place, leather bags are universally used for raising water from wells, and

इवति भीमो वृषभस्तविष्यया शङ्के शिशानो हरिणी विचक्षणः ।

आ योनिं सोमः सुकृतं नि षीदति गव्ययो त्वग्भवति निर्षिगव्ययौ ॥

Rgveda, 9 M. 70 S. 7 A. 2 Ch. 7 v.

एष स्य भानुरुदियति युज्यते रथः परिज्मा दिवो अस्य सानवि ।

पृचासो अस्मिन्मिथुना अधि चयो दतिसूरीयो मधुनो वि रपूयते ॥

Ibid, 4 M. 45 S. 3 A. 7 Ch. 1 v.

See Wilson's *Rgveda*, II. 28.

¹ इन्द्रियाणां तु सर्वेषां यद्येकं चरतौन्द्रियम् ।

ततोऽस्य चरति प्रज्ञा हनेः पादादिवोदकम् ॥

Manu Samhitā, II. 99.

"But when one among all his organs fails, by that single failure his knowledge of God passes away, as water flows through one hole in a leathern bottle."

Ibid, Jones' Translation.

² Pl. xxxi. fig. 1. Fergusson's *Tree and Serpent Worship*, P. 127:

³ सूर्ये विषमा सजामि इति सुरावतो गृहे ।

Rgveda, 1 M. 191 S. 2 A. 5 Ch. 10 v.

⁴ *Ibid*. Wilson's Translation.

according to the law books of Śaṅkha and Likhita,¹ that water is declared pure which is kept in old leather bottles”². To this may be contrasted the prevailing Hindu notion that water is defiled if touched by a Brāhmana in his shoes. Though the leather is not allowed to be a material of dress of the Hindus, except his shoes which are considered as unclean, leather belts formed one of the eight sacred utensils necessary for a śramaṇa of the Buddhist order ; and in the Manu Saṁhitā³ we find the students of theology advised to “wear for their mantles, the hides of black antelopes, of common deer, or of goats.”⁴

5. ANTARVALKALA. THE INNER BARKS OF TREES.

Barks of trees are recommended to be used as splints for the support of fractured bones. In fractures of bones of the foot, leg and thigh, Suśruta directs us to use splints made of barks of trees⁵ to surround the limbs. In the treatment of a simple fracture, Bhāva Mīśra advises us to use cold water first, then mud is to be applied, and lastly the fractured bones should be secured

¹ आपो रूपवदगन्धवत्यः परिशुद्ध जीर्णचर्मकरण्डकेवभृङ्गताः ।

चर्मकरण्डः चर्मपुटः ।

Śaṅkha and Likhita.

² Dr. R. C. Mitra's Indo-Aryans. vol. II.

³ कार्ष्णीरौरववास्तानि चर्माणि ब्रह्मचारिणः ।

वसीरन्नानुपूर्वेण शाण्क्षौमाविकानि च ॥

Manu Saṁhitā, II. 41.

⁴ Ibid. Sir Wm. Jones' Translation. II. 41.

⁵ अथ्यज्य सर्पिषापादं त्वभग्नं कुशोत्तरं ।

वस्त्रपट्टेन वस्त्रीयान्नच व्यायाममाचरेत् ॥

Suśruta Saṁhitā, IV. iii.

by splints and bandages.¹ In the *Yogarātnākara*², we are advised to treat fractures, by lowering the raised end and elevating the depressed end of the bone, and then by using splints and bandages to keep them in position. *Bhāva Miśra*³ describes it similarly after *Suśruta*. *Suśruta* directs us to use barks of *Vata* (*Ficus Indica*, Rox.) and bamboo strips as splints to support the neck after reducing its dislocation by holding at the temporo-maxillary articulations on the sides and the occipital protuberance on the back, and raising him up in the air. He should lie down with his head raised for seven days⁴. In modern times, the Sayre's suspension apparatus and jury mast serve the same purpose.

The barks of *Madhuka* (*Bassia latifolia*), *Aśvattha* (*Ficus religiosa*), *Kukubha* (*Terminalia arjuna*), *Polāśa* (*Butea frondosa*, Rox.), *Udumbara* (*Ficus glomerata*, Rox.) bamboo, *śāla* (*Shorea robusta*), *Vata* (*Ficus Indica*, Rox.) are mentioned as

¹ 'आदौ भग्नं' विदित्वा तु सेचयेच्छीतलागुना ।

पङ्कनानिपनङ्कार्यं वन्धनञ्च कुशान्वितम् ॥

Bhāva Prakāśa, II. iii. *Bhagnādhikāra*.

² पङ्केनानिपनं कुर्याद्वन्धनं च कुशान्वितम् ।

अवनमितसुत्राभ्योदन्नतं चावपीडयेत् ॥

चित्रं विधापि च स्थाने संस्थाप्य विधिसाचरेत् ॥

Yogarātnākara, P. 345.

³ अवनमितसुत्रस्यैदन्नतञ्चावपीडयेत् ।

आञ्छेदतिचित्रमधोगतञ्चोपरि वर्त्तयेत् ॥

Suśruta Saṁhitā, IV. iii.

Bhāva Prakāśa, II. iii. *Bhagnādhikāra*.

⁴ अवटावथहन्वीश्च प्रगृह्योन्नमयेन्नरं ।

तथा कुशान् उमदत्त्वा वस्त्रपट्टेन वेष्टयेत् ।

उत्तानं शाययेद्देनं समरावमतन्द्रितः ॥

Suśrutā Saṁhitā, IV. iii.

supplying the materials of splints¹. Bhāva Miśra² adds Kadamba (Anthocephalus cadamba), Hijjala (Barringtonia acutangula), Sarjja (Pinus longifolia) to the list. Such splints are called kuśa, and Vāgbhaṭa³ says that the splints should be broad, thin, pliant and clean.

Dr. Jacobi, of Dublin, says that he has seen an excellent splint made from the "fresh bark of a tree, taken off while the sap is rising". "It fits admirably", says he, "just like paste-board soaked in water"⁴. Dr. C. C. Jewet⁵ recommends for the same purpose the bark of leriodendron, or tulip tree.

THE CRUTCHES.

The crutches were used to help the crippled. In the Vajasiṇi Saṁhitā of the White Yajurveda, there is a passage describing the different kinds of human victims, appropriated to particular gods and goddesses. The passage occurs also in the Taittiriya Brāhmaṇa with slight differences. There we

¹ मधुकोटुग्वराश्वत्थ पलाश ककुभत्वचः ।

वंशसर्ज्जवटानां वा कुशार्थसुपसंहरत् ॥

Suśruta Saṁhitā, IV. iii.

² मधुकोटुग्वराश्वत्थ कदम्ब निचुलत्वचः ।

वंशसर्ज्जार्ज्जनानाञ्च कुशार्थसुपसंहरत् ॥

Bhāva Prakāśa, II. iii. Bhagnādthikāra.

³ कदम्बोदुम्बराश्वत्थसर्ज्जार्ज्जन पलाशजैः ।

वंशोद्वै वा पृथुभिः सनुभिः सुनिवेशितैः ॥

सुशृङ्खलैः सुप्रतिस्तम्भैः वेल्कलैः शकलैरपि ।

कुशाद्वयैः समं वन्धं पट्टस्यापरि योजयेत् ॥

Aṣṭāṅga Hṛdaya Saṁhitā, VI. xxvii.

⁴ Hamilton's Fractures and Dislocations. 5th Ed. P. 50-51.

⁵ The 20th Mass. vols.

find "to the two (deities) who preside over the gains above or below one's expectation (utkula and vikula), a cripple, who can not move even with the help of a crutch" is recommended to be sacrificed. And again "to the divinity of land, a cripple who moves about on a crutch."¹

The use of the sound limb as a splint of support for the fractured bone of the opposite side was well known. Wooden splints resembling in shape the injured member are also recommended. Suśruta says² that if the hand be fractured, it is to be tied with the opposite hand, but in fractures of both the hands, Gayadāssa³ recommends a wooden hand to be used as a splint for both. After union of the fractured bones, the hands should be made to hold balls of cow-dung, mud and stones.

6. LATĀ OR CREEPERS (TENDRILS OF).

The tendrils of creepers as materials of ligature are mentioned

¹ उत्कुलविकुलाभ्यां (उत्कुलविकुलभ्यः) विस्थिन ।

भूम्य पीडसर्पिनमालभते ।

Taittirīya Brāhmaṇa.

Quoted in Mitra's Indo-Aryans, vol. II, P. 84-85.

² उर्म तले समे कृत्वा तलमग्रस्य दहिनः ।

वध्नीयादामर्तेलेन परिषिक्च कारयेत् ।

प्राग् गोमयमयं पिण्डं धारयेन् सृण्वयं ततः ।

हस्ते जातवलेचापि कुर्यात् पाण

॥

Suśruta Saṁhitā, IV. iii.⁴

³ गथौत उर्मोऽपि हस्ततले तवेकस्य भङ्गे वामं दक्षिणं दक्षिणं वायव्यं, उभयोस्तु भङ्गेन तत्समेन, काष्ठमयेन कृत्वा न अपि वध्नीयादेवं दार्ढ्यं भवतीति, सृत्पिण्डादिधारणमात्मकम् प्राप्तार्थम् ।

Quoted in Dallana's Commentary, IV. iii.

by Suśruta. He recommends¹ to give up a patient, bit by a snake, as hopeless when he does not respond to the application of stimuli, such as cold water, tendrils of creepers, etc. Vāgbhata² advises us to introduce the stalk of the lotus, with a thread tied to it, inside the throat to extract any foreign body stuck there. When the soft stalk is touched by the śalya, it should be extracted by the sudden withdrawal of the stalk and thread.

7. VASTRA OR CLOTH.

Cloth³ as a material of bandages, tents, gauze, etc. has been described before⁴.

8. AṢṬHULAŚMA. STONE OR PEBBLE.

It is a piece of stone—long and round. It is advised to be used for moving arrows fixed in the bone⁵. Caraka⁶ advises us to strike two pieces of stone against each other to resuscitate a

¹ अजीर्णं पितातपं पङ्क्तिर्न चानप्रसङ्गं च भर्त्सनीयम् ।

वृद्धातुराचारवृत्तिर्न च कुरुषु भोक्तव्यं दुर्द्धिर्न च ॥

शस्त्रघाते यस्य न रक्तमस्ति राज्ञोऽप्यतमिष्य न सम्भवन्ति ।

शोताभिरादित्य न राम हृषी विप्रमिश्रितं परिवर्ज्यते ॥

Suśruta Saṁhitā, V. iii.

² कण्ठस्वातागतं शूलं सूत्रं कण्ठं प्रवेशयेत् ।

विस्मृतात् ततः शूलं विसं सूत्रं समं हरेत् ॥

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxviii.

³ वस्त्रं प्रसिद्धं तूलकं सूत्रनिमित्तं वैष्टनार्थं प्रयुज्यते ॥

Vagbhataārtha Kaumudī, I. xxv.

⁴ See P. 176-83.

⁵ अग्रप्रस्तरखण्डं शस्त्रपीडनार्थं निघातनाच्च युज्यते ॥

Ibid.

⁶ अग्रमनाः संघट्टनं कर्णयामुलं शोतोदकेनाथोदकेन वा मुखपरिषेकः ।

Caraka Saṁhitā, IV. viii.

still-born child. In bleeding from the veins of the neck, Vāgbhaṭa¹ advises the patient to hold firmly two pieces of stones in their hands.

A piece of stone is to be used by a person, for holding it with his hand, after recovery from fractures of the carpal and metatarsal bones².

In ancient times, in India, the kings used to decorate themselves with antidotary gems, as a safeguard against poisons.³ Even now the snake charmers apply a black stone on their bodies where they are wounded by the venomous reptile. This stone is popularly known as the vi a-pāthara or poison-stone, and is supposed to have the property of extracting poison from the body.

9. MUDGARA. HAMMER.

Suśruta directs us to use a hammer or a piece of stone to strike an arrow firmly fixed in the bone, until loosened, when it can be conveniently extracted by means of a pair of forceps⁴. It should be pointed out that the tubular instrument—śalya

¹ पाषाणगर्भहस्तस्य जानुष्ये प्रसृते भूजे ।

कुचेरारम्य सृदिने विध्येदङ्गोद्वेपटके ॥

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxvii.

² See foot-note, 2. P. 196.

³ विषैरुदके स्नातो विषघ्नमणिभूषितः ।

परीक्षितं समग्रीयामाङ्गुलाविद्विषवृत्तः ॥

Kāmandakīya Nītisāra, Ch. vii. v. 10.

रचितो गङ्गुरोद्धार मस्त्रियस्य विभूषणं ।

स्थावरं जङ्गमं तस्य विषं निर्व्विषितां ब्रजेत् ॥

⁴ अस्थिदेशोत्तुङ्गित मञ्जीलास्ममुद्गराणामन्यतमस्य प्रहरिण विचाल्य यथामार्गमेव ।

Suśrutā Saṁhitā, I. xxvii.

nirghātānī—described before¹, served the same purpose. Vāgbhaṭa also uses a hammer² to shake an arrow fixed in the bone, and directs us to extract it with the hands or by the various kinds of forceps³.

The Greeks used some iron instrument to shake such an arrow from the place where it was lodged. The hammer was also used by the Greeks and Romans but in a different capacity. Paul mentions its use in cranial surgery to strike the lenticular and gouge⁴. Paul and Celsus describe a “method of extracting foreign bodies from the ear by laying the patient on a board and striking the under side with a mallet.”⁵ Vāgbhaṭa describes this method for draining out water from the ear.⁶

10. PĀNIPĀDATAḌA. THE PALM OF HAND AND SOLE OF FOOT.

11. AṅGULI OR FINGERS.

The surgeon's hand is considered by Suśruta to be the principal instrument as the use of all other instruments depends

¹ See P. 111.

² सुद्धराहृतया नाड्या निर्घात्योक्तुण्डितं हरेत् ।

तैरेव चानयेन्मार्गमार्गोक्तुण्डितं तु यत् ॥

Aṣṭāṅga Hr̥daya Saṁhitā, I. xxviii.

³ अथाहरेत् करप्राप्य करणैर्वेतरत् पुनः ।

दृश्यं सिंहाहिमकरवर्भिं कर्कटकाननैः ॥

अदृश्यं ब्रणसंस्थानाद् गृहीतुं शक्यते यतः ।

कङ्क भङ्गाद् कुरर शरारी वायसाननैः ॥

Ibid.

⁴ Paulus Aegineta VII. xc.

⁵ Milne, Graceo-Roman Surgical Instruments, p. 125.

⁶ कर्णेऽग्नौ पूर्णे हस्तेन मथित्वा तैलवारिणी ।

क्षिपेदधोमुखं कर्णं हन्याद्वा चूषयेत वा ॥

Aṣṭāṅga Hr̥daya Saṁhitā, I. xxviii.

upon it¹. But again he mentions the hand and foot as accessory to, or substitutes for, the instruments. Longmore² says: "Of all instruments for making a complete examination of a gun-shot wound as well as for exploring for foreign bodies which may be lodged in it, the finger of the surgeon is the most appropriate, whenever a wound is large enough to admit of its insertion." There are many instances of the use of hand and foot in the treatment of surgical diseases, but I shall point out a few of them.

1. Both *Suśruta*³ and *Cakradatta*⁴ say that "if a swelling be hard but slightly painful, then it should be well fomented, pressed and rubbed by a piece of bamboo, or palm of the hand, or thumb to cause its subsidence. *Bhāva Miśra* also quotes this verse⁵. *Suśruta*⁶ and *Vāgbhata*⁷ recommend a similar treatment for enlarged glands.

¹ See foot note, P. 99.

² Longmore, *Gun-shot Injuries*, 1877, P. 319.

³ अभ्यज्य श्वेदयित्वा च वेणुना वा शनैः शनैः ।

विमर्द्ध्यैद्विषङ्गं प्राक्षन्निनाङ्गुलकेन वा ॥

Suśruta Samhitā, IV. i.

⁴ अभ्यज्य श्वेदयित्वा च वेणुना दाततः शनैः ।

विस्वापनार्थं सञ्जीयाद् तलेनाङ्गुलकेन वा ॥

Cakradatta, *Vraṇasōtha Cikitsā*.

⁵ अभ्यज्य श्वेदयित्वा च वेणुना दा शनैः शनैः ।

विमर्द्ध्यैद्विषङ्गं प्राक्षन्निनाङ्गुलकेन वा ॥

Bhāva Prakāśa, II. iii.

⁶ हनेषु दोषेषु यथानुपूर्व्यं गच्छी भिषक् श्लेष्म समुत्थिते तु ।

सिन्नस्य विस्वापनमेव कुर्यादङ्गुलकीक्रीपलवेण दण्डैः ॥

Suśruta Samhitā, IV. xviii.

⁷ संस्वेद्य बहुशोथयित्वा विमर्द्दनीयात् पुनः पुनः ।

Aṣṭāṅga Hṛdaya Samhitā, VI. xxx.

2. Suśruta says¹ that “when a morsel of food sticks in the throat, a blow should be fearlessly struck with the fist on the shoulder of the patient without his knowledge”. Vāgbhaṭa² also describes it.

It is however curious to find that exactly the same procedure was adopted by Alsaharavius. Adams in his commentary³ on Paul says that “when a morsel of food sticks to the œsophagus, Alsaharavius directs that the person should be struck on the back, which will facilitate the descent of it”.

3. In the reduction of dislocation of the lower jaw, Caraka used his fingers to do it exactly in the same way as recommended by the modern surgeons. He directs us to depress the lower jaw by the thumbs and at the same time to raise the chin by the index fingers⁴. The verses are quoted by Cakradatta.⁵ The description of the method, quoted from any modern text book, would be a good commentary on the above passage of Caraka. Erichsen says⁶: “The reduction is best effected, by the surgeon,

¹ यासश्च्येत कण्ठासक्तं निःशङ्कमनवुद्धस्तन्मे मुष्टिनाभिहन्वात् स्नेहं मद्यं पानीयम् वा पाययेत् ।

Suśruta Samhitā, I. xxvii.

² अस्थानं स्तम्बघाताभ्यां यासश्च्येत प्रविशयेत् ।

Aṣṭāṅga Hṛdaya Samhitā, I. xxviii.

³ Adam's Commentary on Paulus Ægineta, VI. xxxii.

⁴ व्याप्तानने हनुं स्निग्धमङ्गुष्ठाभ्यां प्रपीड्य च ।

प्रदेशिनीभ्याञ्चोन्नम्य चिचुकोन्नमनं हितं ॥

स्नग्धां सङ्गमयेत् स्थानं स्तम्बां स्निग्धं विनामयेत् ।

प्रत्येकं स्थानदृष्ट्यादिक्रिया वैशेष्यमाचरेत् ॥

Caraka Samhitā, VI. xxviii.

⁵ Cakradatta, Vāṭabyādhi Cikitsā.

⁶ Surgery, Vol. II, p. 658.

standing before the patient, placing his thumbs, well protected by napkins, or a few turns of a narrow bandage, on the molar teeth on each side, and then depressing the angles of the jaw forcibly, at the same time that he raises the chin by means of his fingers spread out and placed underneath it."

4. Caraka says¹ : "After pairing her nails and covering the tip of her index finger with cotton, the nurse is to clean the palate, lips and throat of the new-born child".

With this passage we may compare what Barnes says on the point². "The attendant having then placed the child close to the mother, so as to avoid any strain on the cord, should cleanse its mouth from any fluids, such as blood and mucus, it may have partially swallowed during its passage through the vagina. This should be done at once, as such fluids drawn into the lung vesicles may give rise to inflammation of the lungs, or even septicæmia."

5. Suśruta³ recognises "six modes of diagnosing diseases, namely by the five senses *i.e.* by hearing, smell, taste, sight and touch, and by questions. "Symptoms discernible by the sense of touch are coolness or heat, smoothness or roughness, softness or hardness, and other tangible qualities of the skin in fever, dropsy,

¹ अथास्य तालोष्ठकण्ठजिह्वाप्रमार्जनमारभेत अङ्गुल्यासुपरिलिखितनखया सुप्रचालितो-
पधानकार्पासपितुमत्यः प्रथमं प्रमार्ज्जितस्यास्य च शिरस्तालु कार्पासपितुना केहगर्भेन प्रति-
च्छादयेत् ।

Caraka Saṁhitā, IV. viii.

² Obstetric Medicine and Surgery, Vol. II, p. 105.

³ षड्विधो हि रोगाणां विज्ञानोपायः । तद्यथा पञ्चभिः श्रोत्रादिभिः प्रश्नेन चेति ।

* * * स्पर्शनेन्द्रियविज्ञेयाः शीतोष्णदृक्का कर्कशमृदुकठिनत्वादयो ज्वरशोफादिषु ।

Suśrutā Saṁhitā, I. x.

and other diseases." And we know how important it is to educate the tactile sense in the diagnosis of diseases.

6. The foot is recommended to fix a part of the human body whence any foreign body may be removed easily by the hands.¹ Suśruta says²: "If a foreign body cannot be easily extracted, as when it is impacted in the hollow or the substance of a bone, the part should be pressed by the feet, and it should be drawn out by the instrument." Vāgbhaṭa also gives a similar description³. Caraka describes a method of removal of the placenta if not spontaneously separated. One of the female attendants should press upon the navel of the puerpera forcibly with her right hand, while with the left hand placed upon her back, she should shake her. Then the heel is to be placed on the patient's buttock while the two sides of the gluteal regions are also to be pressed and shaken⁴.

12. JIHVĀ OR TONGUE.

The organ of taste as a means of diagnosis is noted by

¹ पाद इति पादेन शरीरदेशं धृत्वा हस्तादियन्त्रेण उद्धरणान्ति क्रियन्ते ।

Vāgbhaṭārtha Kāumudī, I. xxv.

² अस्थिविवरप्रविष्टं अस्थिविदष्टं वाऽवगृह्य पादाभ्यां यन्त्रेणापहरेत् ।

Suśruta Saṁhitā, I. xxvii.

³ अस्थिदृष्टे नरं पदभ्यां पीडयित्वा विनिर्हरेत् ।

इत्यश्वके सुबलिभिः सुगृहीतस्य किङ्करैः ॥

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxviii.

⁴ तस्याश्च दमरा न प्रपन्ना स्यादथैनान्मन्यतमा स्त्री दक्षिणेन पाणिना नाभेरुपरिहाहलवत् निपीड्य सव्येन पाणिना पृष्ठत उपसंगृह्य सुनिर्द्धृतं निर्द्धृत्यात् । अथास्याः पादपार्श्वग्रा-
ओष्ठीमाकोटयेदस्याः स्निग्धावुपसंगृह्य सुपीडितं पीडयेत् ।

Caraka Saṁhitā, V. viii.

Suśruta¹. "Symptoms discernible by the sense of taste are the various tastes noticeable in morbid secretions of urine and other diseases". Cakrapāṇi "explains that 'inference' is necessary, because the sense of taste can not be exercised by the physician on the patient directly;"² he must do it through some intermediate agents such as ants, whose attraction to sugar is well-known and so the presence of sugar in urinary diseases can be inferred."

13. DANTA OR TOOTH.

Ivory as a material of surgical instruments has been described before³. Suśruta⁴ advises us to use the ash of ivory with stibium as a stimulant to the growth of hair on a scar. It is also recommended by Vāgbhaṭa⁵.

14. NAKHIA OR NAILS.

Suśruta advises the surgeon to use his nails⁶ for the operation of cutting, piercing and extraction, if these can be possibly helped by his nails.

In modern times, nails often help the surgeons in separating

¹ रसनेन्द्रिविशेषाः प्रमेहादिषु रसविशेषाः ।

Aṣṭāṅga Hṛdaya Saṁhitā, I. x.

² Hearnle's Commentary on the Suśruta Saṁhitā, I. x. (Bibliotheca Indica).

³ See page 67.

⁴ हस्तीदन्तमसौ कृत्वा मुख्यश्चैव रसाञ्जनं ।

रोमाख्येतेन जायन्ते लिप्ता पानितलेष्वपि ॥

Suśruta Saṁhitā, IV. i.

⁵ तैलाक्ता हस्तिदन्तस्य मषी वा चौषधं परम् ॥

Aṣṭāṅga Hṛdaya Saṁhitā, VI. xxiv.

⁶ आहार्यच्छेद्यभेदेषु नखं शक्येषु योजयेत् ।

Suśruta Saṁhitā, I. viii.

layers of tissues during operation as in the operation for the radical cure of hydrocele. We often extract thorns, impacted in our body, with our nails.

15. MUKHA OR MOUTH.

The use of mouth as a suction apparatus was well known to the ancients. Suśruta advises us to use āṛā or pāṇimantha (awl) to perforate bone in diseases of the medullary canal, caused by obstructed and deranged air. He next introduces one end of a tube, open at both ends, into the canal through the perforation in the bone, while through the other end the surgeon sucks out air by his mouth¹. The use of mouth for sucking out air through the śṛīga or horn has been described before². Caraka says³ that the poison of a snake-bite may be sucked out by the surgeon's mouth, filled with flour or ash. Even in modern times, it is common amongst Indians to suck out blood, in accidental cuts by knives, by the mouth. The practice of the suckers in Europe has been noted before⁴.

16. VĀLA OR HAIR.

Horse-hair is to be used for applying ligatures round the piles⁵. It is also a material of suture for the skin. Horse-hair is also described to have been used for raising pterygium. Paul⁶ also used horse-hair to raise a pterygium.

¹ निरुद्धेऽस्थनि वा वायौ पाणिमथ्येन दारिते ।

नाडीं दन्तास्थनि भिषक् चृषयेत् पवनं बली ॥

Suśruta Saṁhitā, IV. iv.

² See P. 148-49.

³ दंशं वा चूषेन्मुखेन यवचूर्णपांशुपूर्णम् ।

Caraka Saṁhitā, VI. xxv.

⁴ See P. 149-50.

⁵ बालाः, अश्वदीनां पूच्छभवकेशा नृकेशाश्च अशो वाल्यादि बन्धनार्थं युज्यते ।

Vāgbhaṭārtha Kaumudī, I. xxv.

⁶ Paulus Ægineta, VI. xviii.

Suśruta¹ says: "Bundles of hairs or tents are to be used in the treatment of wounds in the skull, formed by the extraction of an arrow from the brain. These would prevent the hernial protrusion of the cerebral substances from passing out through the wound. The hairs are to be removed one by one, as the wound heals up gradually." Vāgbhata² also approves this treatment.

A bundle of hairs tied to a long thread is mentioned by Suśruta to have been used for the extraction of fish-bones from the throat³. The patient is directed to swallow the ball of hairs with some liquid. Next emetics are to be administered to excite vomiting. During this act, the foreign body gets entangled in the meshes of the ball, which being then suddenly pulled out by the thread outside, extracts the fish-bone satisfactorily. Vāgbhata⁴ also describes it similarly. For this purpose

¹ शिरसोऽपहते शल्ये वालवर्त्तिं प्रवेशयेत् ।

वालवर्त्त्यामदत्तयां मस्तुलुङ्गं व्रणात् खवेत् ॥

Suśruta Saṁhitā, IV. ii.

² कार्या शल्याहते विद्धे भङ्गाद्विदलिते क्रिया ।

शिरसोऽपहते शल्ये वालवर्त्तिं प्रवेशयेत् ॥

मस्तुलुङ्गसुते क्रुद्धो हन्यादेनं चलोऽन्यथा ।

व्रणे रोहति चैकैकं शनैरपनयेत् कचम् ।

मस्तुलुङ्गसुतीः खादेन्मस्तिष्कानन्यजीवजान् ॥

Aṣṭāṅga Hṛdaya Saṁhitā, VI. xxvi.

³ अस्थिशल्यमन्यद्वा तिर्यक्कण्ठासक्तमवेचा केशोण्डुकं दृढे क सूतवद्धं द्रवभक्षोपहितं पययेदाकण्ठाच्च पूर्णकोष्ठं वामयेद्भमतय शल्यै कदेशसक्तं ज्ञात्वा सूतं सहसा लाचिपेत् ।

Suśruta Saṁhitā, I. xxvii.

⁴ केशोण्डुकेन पीतेन द्रवैः कण्टकमाचिपेत् ।

सहसा सूतवद्देन वमत सेन चैतरत् ॥

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxviii.

a tooth brush formed by chewing the end of a narrow branch of a tree is also recommended¹. A common domestic remedy is to make the patients swallow large morsels of boiled rice, plantain, etc.

Paul² mentions a similar contrivance, and says: "Some are of opinion that the patient ought to be made to swallow large morsels, such as stalk of lettuces or pieces of bread; but others direct us to bind a thread about a small piece of clean soft sponge and give it to the patient to swallow, and then taking hold of the thread to draw it up, and to do this frequently in order that the thorn may get fixed in the sponge and be brought up". For this purpose Aetius used the epilation forceps. Paul calls it *acanthobolus* or the fish-bone forceps.

The modern surgeons use a probang for the same object. "Small sharp bodies, such as bristles, fish-bones, or pins, are generally found sticking between the pillars of the fauces and the tonsils." Such bodies "should not be pushed on, but an endeavour should be made to catch them with the "horse-hair probang." This being pushed gently, unexpanded, beyond the point where the pin or bone is stuck, is expanded by pulling up the handle and then withdrawn with a slight rotatory motion."³

• Caraka⁴ mentions the practice amongst the recently delivered

¹ मृदुना वा दन्तधावनकुञ्चकेनापहरेत् ।

Suśruta Saṁhitā, I. xxvii.

² Paulus Ægineta, VI. xxxi.

³ Swain's Surgical Emergencies, 3rd ed., Pp. 32-33.

⁴ अथास्या बालवेष्टा कण्डतालु परिश्रयेत् ।

Caraka Saṁhitā, IV. xviii.

women to push a braid of her hair into her throat, to help the expulsion of the placenta. So in the *Yogarātnākara*¹, her throat is advised to be rubbed by a finger surrounded by hairs. This practice is still prevalent among the women of Bengal to a certain extent.

SUTURE MATERIAL.

Horse-hair was the material used by the Hindus for sutures. Besides it, they used² sutures of fine thread, or the fibres of the bark of *Aśmantaka* (*Cæsalpina digynia*), or threads made of hemp or flax, or of the fibres of which bow-strings were made, or of the fibres of the *Mūrvvā* (*Sansevieria zeylanica*) or *Guḍūcī* (*Tinspora cordifolia*). Besides these, the Hindu surgeons used the mouth parts of the ants as clasps to close incisions on the intestines. *Suśruta*³ describes the use of living black ants to close the incisions on the walls of the intestines, during the operation for intestinal obstruction, after removing the scyballi, stones, etc. He advises us to remove the bodies of the ants, leaving their heads fixed on the margins of the incision,

¹ केशवेष्टित्याङ्गुला तस्याः कण्ठं प्रघर्षयेत् ।

Yogarātnākara, P. 437.

² सीव्येत् सूक्ष्मेण सूत्रेण वल्केनाश्मन्तकस्य वा ।

सनजचीमसूत्राभ्यां स्नायुा वालिन वा पुनः ॥

सूत्र्वाङ्गुलीतानैर्वा ।

Suśruta Saṁhitā, I. xxv.

स्नायुा सूत्रेण वल्कलेः ।

सीव्येन्न दूरे नासन्ने गृह्णान्नास्यं न वा बहु ॥

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxix.

³ परिस्त्राविष्टाद्येवमेव शल्यमुद्धृत्यान्त्रावाप्तं संशोध्य तच्छिद्रमन्त्रं समाधाय कृष्ण-
पिपीलिकाभिर्दृश्येत् दष्टे च तासां कायानपहरेन्न सिरांसि ततः पूर्व्ववत् सीव्येत् ।

Suśruta Saṁhitā, IV. xiv.

in the act of biting. Then the intestines should be replaced with the ants' heads sticking to them. Caraka¹ also describes the use of ants for obliteration of small perforations in the intestines, but he takes away the ants before replacing the gut into the abdominal cavity. If by any accident, the abdominal muscles be incised and the intestines come out of a gaping wound, Suśruta recommends us to allow black ants to bite the exposed coils of intestines before replacing them into the abdomen². This is a curious practice of ancient surgery of the Hindus. The Greeks and Arabs never mentioned it. "Amongst some Indian tribes, it is customary to allow both edges of a wound to be seized by the sharp head-nippers of certain ants, whose bodies are then rapidly cut off; one ant after another being used, the wound is closed."³

Suśruta describes four sorts of sutures, *viz*:

1. Vellitaka or winding.
2. Gophaṇikā or like a sling.
3. Tunna sevani or continued sutures.
4. Rjugranthi or interrupted sutures.

¹ क्षिद्राण्यन्तस्य तु स्थूलैर्दंशयित्वा पिपीलिकैः ।

बहुशः संगृहीतानि मत्वा च्छित्त्वा पिपीलिकान् ।

प्रतियोगैः प्रवेशयान्न' वद्धिः सीव्येद् व्रणं ततः ॥

Caraka Saṁhitā, VI. xviii.

² अभिन्नमन्त्रं निष्क्रामं प्रवेश्य' नान्यथा भवेत् ।

पिपीलिकाशिरीयस्तं तदाप्येके वदन्ति तु ॥

प्रचाल्य पयसा दिग्धं दृणशीणित पांशुभिः ।

प्रवेशयेत् कृत्तनखो घृतेनाक्त' शनैः शनैः ॥

Suśruta Saṁhitā, IV. ii.

³ Neuburger's History of Medicine. Playfair's Translation, Vol. I., P. 9

These are advised to be so applied as they may suit the different parts of the body¹. The needles must not be introduced either too far from, or too close to the edges of the wound. In the former case, the lips of the wound shall be inflamed and so cause pain, while in the latter, the sutures will give way².

The use of horse-hair as a material for suturing wounds was unknown to the Greeks and Romans. They used sutures of flax and woollen threads for wounds. Paul says: "Afterwards we unite the separated parts with a needle containing a woollen thread, being satisfied with two sutures."³ Celsus³ advises us to use sutures of soft thread; and the apollinose of Hippocrates⁴ is directed to be made of crude flax.

17. AŚVAKAṬAKA. THE RING OF A HORSE'S BRIDLE.

Suśruta says that when the arrow is firmly fixed in the bone and if it can not be extracted by forcible pulling by hands or instruments, it should be tied to the ring of a horse's bridle. Then the animal is to be whipped, when by the sudden movement of the horse, the weapon would be jerked out of the wound⁵.

18. ŚĀKHĀ OR BRANCH OF A TREE.

Another method is to tie such an arrow by means of a rope

१ सीव्येदेक्षितकं शनैः ।
सीव्येद्वीक्षणिकां वापि सीव्येद्वा तुद्गमेवनीं ।
ऋजुयन्त्रिमथो वापि यथायोगमथापि वा ॥

Suśruta Samhitā, I. xxv.

¹ Paulus Aegineta, VI. xii. Adam's Translations.

² Celsus, V. xxvi.

³ Hippocrates, iii. 132.

⁴ अश्वकटकके वा वध्नीयादथैनं कथया ताडयेद्यशोन्नमयन् शिरोवेगेन शल्यमुद्धरति ।

Suśruta Samhitā, I. xxvii.

to the branch of a tree, lowered by pressure¹. When the pressure is released, the branch suddenly goes high up, and thereby it pulls the weapon out of the wound². Dallana, however, mentions another view that a bridle-ring and a branch of a tree are both required for the extraction of foreign bodies³. Hærnle remarks: "The branch apparently is put through the ring to afford a stronger pull"⁴. Vāgbhaṭa⁵ also mentions these contrivances.

19. ŚTHĪVANA OR SPITTLE.

Dallana⁶ understands by it—"throwing out expectoration and saliva by the mouth." By this means any foreign body lodged in the oral cavity, such as in the gums, fauces, may easily be got rid of.

¹ दृढां वा हचशाखामवनस्य तासां पूर्ववदवद्भोद्धरेत् ।

Suśruta Saṁhitā, I. xxvii.

² शाखा, हचशाखा, वद्वायास विनमितायां शाखायां शल्याग्रभागं दृढं वद्वा, सहसा शाखात्यागेन उच्छ्रितया शाखया शल्यसुप्त्रियते ।

Vāgbhaṭārtha Kaumudī, I. xxv.

³ अन्ये त्वेवं पठन्ति अशक्यमेवं वा बलवद्भिः सुपरिगृहितस्य यन्त्रेणैवं यादृशित्वा शल्य-
मावर्द्धं प्रविभूज्य धनुर्गुनैर्व्वहैकतः शायान्त्रककटके वध्नीयात् । अथैनम् इत्यत्र कारकेक
पाठः कश्या ताडयेत् यथोन्नमयन् शिरोवेगेन शल्यमुद्धरेति, नमितायां पञ्चाङ्गां हचशाखायां
व पूर्ववद वद्भोद्धरेदिति ॥

Nivandha Saṁgraha, I. xxvii.

⁴ The Suśruta Saṁhitā. Bibliotheca Indica. P. 48. foot note 109.

⁵ तथाप्यशक्ये वारङ्गं वक्रौक्ष्य धनुर्जया ।

सुवर्द्धं वक्रकटके वध्नीयात् सुसमाहितः ॥

सुसंयतस्यः पञ्चाङ्गा बाजिनः कशायथ तम् ।

ताडयेदिति सूद्धानं वेगेनोन्नमयन् यथा ॥

उद्धरेच्छल्यमेवं वा शाखायां कल्पयेत्तरोः ।

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxviii.

⁶ छीवणं श्लेष्मादिनिरसनम् ।

Nivandha Saṁgraha, I. vii.

20. PROVĀHANA OR FLUXING THE PATIENT.

This comprises the acts of emesis, purgation and lacrymal secretion. Thus the foreign bodies lodged in the alimentary canal or eyes may be got rid of by causing discharges from the bowels, the stomach, or the eyes¹.

21. HARṢA OR OBJECTS EXCITING HAPPINESS.

Persons suffering from vṛāṇa or wound are directed to have their minds in a state of cheerfulness by the sight of objects exciting happiness². A cheerful man is a better subject for a surgical operation than a morose and gloomy one. Vāgbhaṭa³ adds fear as an accessory instrument. Joy and fear cause a sudden change in the temper of a man and so may be of some help in curing diseases⁴. Suśruta regards, sorrow as a śālya or foreign body which is to be removed by joy.⁵

22. AYAṢKĀNTA OR LOAD-STONE.

Magnet was known to the ancient Hindus⁶ and they used it

¹ तवायुचवधूद्धार कास मूत्र पूरीषानिलैः स्वभाववत्प्रवृत्तै नयनादिभ्यः पतति।

Suśruta Saṁhitā, I. xxvii.

² सुहृदो विचिपन्त्याश्च कथाभिर्ब्रणवेदनाः ।

आश्वासयन्तो बहुशस्त्रनुकूलाः प्रियम्बदाः ॥

* * * *

सम्पदाद्यनुकूलाभिः कथाभिः प्रीतिनानसः ।

अशवान् व्याधिमोचाय चिप्रं सुखमवाप्नुयात् ॥

Suśruta Saṁhitā, I. xix.

³ See foot-note 1, P. 98.

⁴ भय हर्षौ शरीरस्य सहस्रा भावान्तरमुत्पादयन्तौ यन्त्रकार्यं कुरुत इति ।

Vāgbhaṭa's Artha Kaumudī, I. xxv.

⁵ हृदयस्थित मनेक कारणीतृपन्नं शोकशल्यं हर्षणेति ।

Suśruta Saṁhitā, I. xxvii.

⁶ मणिगमनं सूचमिसर्पणमष्टकारणकं ।

Vaiśeṣikā Darśanam, Ch. V. Āhnikā 15.

to extract minute foreign bodies such as iron particles from the eyes and teeth. *Suśruta*¹ also mentions its use for extracting an arrow from the wound, if it be without barbs.

In modern times, a magnet is still used for removing a particle of iron from the eye. "Indeed, cases have occurred in which the application of an inch bar-magnet connected with four Grove's cells to the outside of the cornea has caused the foreign body to retrace its course and emerge through the wound"². A fragment of iron lying in the vitreous has been removed by the Snell's electro-magnet introduced through the scleral wound behind the ciliary region. "The following plan of ascertaining whether a portion of needle be really impacted has been suggested by Marshall, and successfully carried into practice by Littlewood of Leeds. A powerful magnet is to be held upon the part for a quarter of an hour, so as to magnetise the fragment; a firmly hung polarised needle should then be suspended over it, when, if any iron is present, deflection will ensue."³

23. KṢĀRA. CAUSTICS OR POTENTIAL CAUTERY.

Caustics were highly extolled by the ancient surgeons as the external applications are better tolerated by the weak and

सूक्ष्मसर्पणमिति सूक्ष्मपदेन लौहमात्रं दृशश्चोपलक्षयति: तथा चायस्कान्ताभिमुखं
यत् सूचादिर्गमनं * * * * *

Śaṅkara Miśra, Upaskāra.

¹ अनुलोममनववहकर्मनत्प ब्रह्मसूत्रमयस्कान्तेन ।

Suśruta Samhitā, I. xxvii.

² Carter's Ophthalmic Surgery, 2nd ed., P. 369.

³ Erichsen's Surgery, Vol. I, P. 343.

timid persons who are afraid of the surgeon's knife¹; though Suśruta² distinctly states: "The following persons should not be treated with caustics: weak people, children, old and timid people, etc." They even give them preference to the knife for they argue that surgical diseases are radically cured by the application of the caustics, without any possibility of recurrence. Suśruta says³: "Of all cutting instruments and their substitutes, caustics (or vegetable alkalis) are the most important, because by means of them deep and superficial incisions and scarifications may be made, derangements of the three humours may be rectified and some diseases can be treated with special advantage."⁴

For the preparation and uses of caustics, see the Suśruta Saṁhitā, I. xi.

For the application of potential cauteries, three classes of instruments are recommended.⁵

1. Darvī—it is to be made of wood and should resemble a spoon in appearance.

¹ अल्पसत्वेऽवली बाली पाके चातर्था मुञ्जते ।

दारुणं मर्म्म सन्ध्यादिस्थिते चान्यत्र पाटनं ॥

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxix.

² अथ नैने चारुक्रियाः । तद्यथा दुर्वलबाल स्थविर भौरुसर्वाङ्ग शूलोदरि रक्तपित्त-
गर्भिण्यृतुमती प्रवृद्धाग्नि प्रवेद्योरः चतुर्चीनटणा मूर्च्छोपद्रुतक्लीवापन्नतोद्भूत फलयोगयः ॥

Suśruta Saṁhitā, I. xi.

³ शस्त्रानुश्लेष्यः चारः प्रधानतमक्केयभेदलेख्य करणाविदोषप्लवादिशेषक्रियावचारणाच्च ।

Suśruta Saṁhitā, I. xi. .

⁴ Ibid. Hoernle's Trans. Bibliotheca Indica.

⁵ आध्याय च दुर्वीर्क्ष शलाकानामन्यतमेन चारं पातयेत् ।

Suśruta Saṁhitā, IV. vi.

2. Śalākā or rods,—plain probes are mentioned for application of caustic lotions to parts of the body. But generally the ends of the probes are shaped like spoon. To this class belongs the three spoon-like probes of Suśruta and the three nail-shaped probes of Vāgbhaṭa, described before¹.

3. Kūreca,—it is a brush-like instrument.

The application of caustics has its advantages and disadvantages; and these are to be considered in their relations to the pre-anaesthetic periods of surgery. Patients are still less terrified by their application than by surgical incisions. The real value of caustics is thus summed up by Velpeau.² “Nevertheless caustics possess some advantages which can not be denied them. As they do not give the idea of an operation, they shake less the minds of the patients, they are accepted with more calmness and with infinitely less effort, than the action of the knife. Mortifying the tissues step by step, they give rise to no effusion of blood, and affect less deeply the economy than the operation, properly so called. Women treated in this way do not require to remain in bed or to consider themselves as patients. The dressings require little care, and do not demand absolutely the intervention of the surgeon. The wound cleans itself very rapidly in general, and once cleaned, it proceeds speedily towards cicatrisation. Without exempting wholly erysipelas, phlebitis or purulent infection as some surgeons have asserted, there is notwithstanding, some reason for supposing that they expose the patient somewhat less to these troublesome complications than the operation”.

¹ See P. 158-159.

² Velpeau. Cancer of the breast. Marsden's trans.

25. AGNI. ACTUAL CAUTERY.

Suśruta says¹: "With regard to surgical treatment, actual cautery is said to be superior to caustics, in as much as diseases treated with the actual cautery do not re-appear, and because it can cure diseases which are incurable by medicines instruments, and caustics."² This partiality for cauteries is one of the reasons of the gradual decadence of Hindu surgery and its total extinction in the present time. To this belief of the Hindus may be compared the following aphorism of Hippocrates³:—

"Those diseases which medicine do not cure, the knife cures; those which iron can not cure, fire cures; and those which fire can not cure, are to be reckoned wholly incurable".

For the application of the actual cautery the following articles are considered necessary⁴:—

1. Pippali or piper longum
2. Goat's dung
3. Teeth of a cow
4. Śara or saccharum sara
5. Probes or śalākā (see before⁵)

} These are to be used for
diseases of the skin.

¹ चारादग्रिर्गरीयान् क्रियासु व्याख्यातस्तद्गन्धानां रोगानामपुण्यभावाद्भिषजश्चचारैरसाध्यानां तत्साध्यत्वाच्च ।

Suśruta Samhitā, I. xii.

² Ibid. Hoernle's Trans. Biblio. Ind.

³ The Works of Hippocrates. Syd. Soc., vol. II., p. 774.

⁴ अथैमानि दहनोपकरणानि । तद्यथा पिप्पल्यज्राशक्नोदन्त शरशलाका जाम्बवीष्टेतर-
लीहाः चौदगुडक्षेहाश्च । तत्र पिप्पल्यज्राशक्नोदन्त शरशलाकास्त्वगतानां । जाम्बवीष्टेतर-
लीहानि मांसगतानां चौदगुडक्षेहाः सिरस्त्रायु सम्यस्थिगतानां ।

Suśruta Samhitā, I. xii.

⁵ See P. 159-60.

- | | | |
|----------------------------|---|---|
| 6. Jāmvaṣṭha ¹ | } | Used for diseases of the
museles. |
| 7. Different kinds of iron | | |
| 8. Honey ² | } | Used for diseases of the
vessels, joints and
ligaments. |
| 9. Treacle | | |
| 10. Ghee | | |
| 11. Oil | | |

“Both Aetius and Oribasius represent goat’s dung, pounded with vinegar, as being equally efficacious as the sinapism, and applying particularly to ischiatic diseases.”³ Hippocrates says that cauterisation may be performed with boxwood spindles dipped in boiling oil.⁴ In Kordofan, are used “*El kamaia*, primitive instruments used for cauterisation consisting of a piece of camel’s or sheep’s dung dried and impaled on a long thorn.”⁵

12. Cautey knife.—This is to be used in the treatment of prolapse of the omentum in cases of abdominal injuries. The

¹ अशीं भगन्दरयमिनाङ्गीदृष्टवशादिषु ।

मांसदाहो मधुमेह आम्बवीष्ट गुडादिभिः ॥

Aṣṭāṅga Hṛdaya Saṃhitā, I. xxx.

² मधुच्छिष्टेन तैलेन मज्जचीद्रवसाप्लवः ।

तमेवा विविधैर्ली हेर्दहद्वाह विशेयवित् ॥

Caraka Saṃhitā, VI. xiii.

³ Adams’ Commentary on Paul, vol. iii. bk. vii. sec. xix.

⁴ Hippocrates, ii. 482.

⁵ Medical Practices in Kordofan, Third Report. Wellcome Research Laboratory, Khartoum.

prolapsed part is to be ligatured well and the cautery knife used to remove the prolapse below the ligature¹.

Cautery knife was also known to the Greeks and Romans. Galen², speaking of cancer, says that "some use heated razor blades, at once cutting and burning". Paul³ also mentions a sword shaped cautery in the radical cure of hydrocele.

13. Plates of copper, lead or iron.—In the application of both kinds of cauteries, plates of these metals are to be used to surround a tumour to prevent injury to the adjacent structures (Suśruta).⁴

Hippocrates⁵ in the treatment of nasal polypus, says that "when that occurs we must insert a tube and cauterise with three or four irons". Celsus⁶ says that this tube may be a calamus or a tube of pottery.

14. Cakradatta mentions a probe of gold for applying actual cautery to the hair follicles after the removal of the eyelashes, to prevent a recurrence of trichiasis.⁷

Albucasis similarly recommends burning the roots of hairs

¹ उदरान्नेदसो वर्त्तिर्निगता यस्य देहिनः ।

कषायभस्मसत्कीर्णं वद्धा सूत्रेण सूत्रयित् ।

अधितमेन शस्त्रेणच्छिन्द्यान्मधुसमायुतं ॥

Suśruta Saṁhitā, IV. ii.

² Galen. xiv. 786.

³ Paul, vi. lxii.

⁴ यदल्पमूलं वपुतामसीस पट्टेः समाविष्टा तदायसैर्वा ।

चाराधिशस्त्राण्य सक्तद्विदध्यात् प्राणानहिंसन् भिषग्प्रमत्तः ॥

Suśruta Saṁhitā, IV. xiii.

⁵ Hippocrates, ii. 244.

⁶ Celsus, vii. x.

⁷ See foot-note 2 p. 198

in trichiasis with a probe of gold. Paul¹ applies a heated olivary probe or an aural probe for the same purpose. Haly Abbas and Rhazes also describe this operation.

26. BHEṢAJA OR MEDICINES.

This means such medicines as become necessary in the treatment of surgical diseases and do the work of surgical instruments to a certain extent. Suśruta gives a list of medicines,² required in the treatment of various kinds of inflammations, and I quote a few passages from the English translation³ to illustrate the action of medicines in surgical practice. "Warm poultices made of the following drugs promote suppuration, namely, fruits of *sana* (*Crotalaria juncea*), *Mūlaka* (*Raphanus sativus*), *Śigru* (*Moringa pterygosperma*), seasum and mustard seeds, flour of barley and wheat, *kiṇva* (the drugs used as a ferment in distilling spirits) and linseed. The following medicines are applied for opening abscesses, namely, *chiravilva* (*Pongamia glabra*), *agnika* (*Semicarpus anacardium*), *chitraka* (*Plumbago Zeylanica*), *danti* (*Baliopermum montanum*), *hayamādraka* (*Nerium odorum*), and the excrement of the pigeon, vulture and heron. Caustic alkalies are also very effectual in opening abscesses. Demulcent articles, such as, flour of barley, wheat or *māśka* (pulse of *Phaseolus Rur.*) promote discharge from the interior of abscesses. * * * * Pastils for fumigating ulcers should be made of *śīrśheṣhtatka* gum of (*Boscellia Thurifera*), *sarjaraśa* (resin of *Shorea robusta*), *sarala* (*Pinus longifolia*), and *devadāru* (*Cedrus*

¹ Paul viii. xiii.

² See Suśruta Saṁhitā, I. xxxvi.

³ Dr. F. C. Dutt's Translation, Bibliotheca Indica. P. 151-154.

deodara); decoctions or cold infusions of astringent and unirritating barks should be used as washes for promoting granulations in ulcer. Tents for promoting granulations should be made of *soma* (*Sarcostemma brevistigma*), *amṛita* (*Cocculus cordifolius*), *aśvagandhā* (*Withania somnifera*), the plants included under the class of *kákolyádi*, and the buds of (*Ficus Bengalensis*)”.

In treating inflammation, the Hindu surgeons used pastes to give relief to the pain and tension; warm poultices to promote suppuration; medicinal applications and incisions by knife for opening abscesses; demulcent articles to promote discharges; decoctions of drugs as corrective washes; tents of drugs and lints for introducing them into the cavities of the abscesses; decoctions in oils and clarified butter to improve the character of ulcers; pastils for fumigating sores; tents, pastes, powders and lotions for promoting granulations; drugs to repress high granulations; drainage to prevent infection, and bandages to give the part rest. This shows that the Hindus were not wholly ignorant of the antiseptic methods of treating wounds; and Suśruta enjoins that a certain incense should be kept burning in the operation room.

Of the additions to the list of Suśruta by Vāgbhaṭa, we need consider the goat's gut only.

GOAT'S GUT.

The intestines of the goats, etc. are to be dried and prepared as materials of ligature¹. They should be used in ligaturing fine vessels after incision by knife, evidently to check hæmorrhage.

¹ See foot note I, P. 223.

The use of goat's gut in surgery is generally considered to have been unknown to the Greeks and Romans, as it is not mentioned in their works. But Adams points out¹ "that the strings of ancient harp were made of the guts of a sheep," and this he clearly proves from a passage in the *Odyssey* of Homer.

Hippocrates² used apolinose made of crude flax, which is also mentioned by Paul for the delegation of arteries. Rhases however describes the use of strings of harp³ as a material for suture in the operation called *gastrophé*.

ARREST OF HÆMORRHAGE.

It is generally believed and often stated in modern works on surgery that the ancients were unacquainted with the proper treatment of hæmorrhage. Suśruta however enumerates four different ways of arresting hæmorrhage after venesection; namely:

1. Sandhāna:—Contraction of the wound by astringent decoctions of Chebulic Myrobolan and the root-barks of the panchavalkala trees (five barks).
2. Skandana:—or thickening of the blood by the application of severe cold.
3. Pāchana:—or descicating or drying up the wound by ashes.
4. Dahana:—or cauterising the veins to make them shrink⁴.

¹ See Commentary on Paul, VI. lii, vol. II, P. 345. Syd. Soc. Ed.

² Hippocrates, iii. 132.

³ Rhases. Cont. xxviii.

⁴ चतुर्विधं यदेतद्भि रधिरेत्य निवारणं ।

समानं स्कन्दनञ्चैव पाचनं दहनं तथा ।

If the blood does not thicken by the application of cold, astringents should be applied; if these fail ashes should be used. By means of these three modes, the physician should endeavour to the best of his abilities to stop the bleeding, but if success be not still obtained, cautery may be resorted to as the absolute effective means¹. To stop bleeding from an artery, he advises us to apply astringents and pressure with the fingers. Vāgbhata² also describes these methods of arresting hæmorrhage, and advises us that if the ordinary means do not check the bleeding, the vessel must be again opened at a point in its course beyond the bleeding area, or actual cautery applied. Cakradatta also repeats these directions³.

Vāgbhata however mentions the sheep's gut amongst the accessory instruments. His commentator explains its use for

व्रणः कषायः सन्धत्ते रक्तं स्कन्धये हिमं ।

तथा सम्पाचयेद्दह्य दाहः सङ्कोचयेत् सिराः ॥

Suśruta Saṁhitā, I. xiv.

¹ अकृन्दमाने रुधिरं सन्धानानि प्रशोत्रयेत् ।

सन्धाने भग्नमाने तु पाचनेः समुपचारेत् ॥

कल्परैतैस्त्रिभिर्वैद्यः प्रयतेत यथाविधि ।

असिद्धिमत्सु चैतेषु दाहः परम इत्यने ॥

Ibid.

² रक्ते त्वतिष्ठति क्षिप्रं क्षामनीमाचरेत् क्रियात् ।

लोध्रं प्रियङ्गु पचद्ग माषयथाह गोरिकैः ॥

मृतकपालाञ्जनचीम मषी चीरीत्वगङ्गुरैः ।

विचूर्णयेद् व्रणमुखं पद्मकादि हिमं पिवेत् ॥

तामिव वा शिरां विध्येद्वाधात् तस्मादनन्तरं ।

शिरासुखं यः लरितं दहेत् ततश्चलाकया ॥

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxvii.

³ See Cakradatta, Śirāvyādhādhikāra.

ligaturing blood-vessels¹. Suśruta says that if in venesection, or in treating wounds, excessive bleeding occurs, it should be stopped by proper means².

Celsus³ advises us to fill up the wound with dry pledgets, then to apply a sponge squeezed out of cold water and to press with the hand. If not successful, cut the vessel asunder between two ligatures, or apply cautery, or try the method of revulsion. Galen⁴ applies pressure by finger on the wounded vessel, or twists it moderately. If the vessel be an artery, he gives the alternative of a ligature or cutting across. Paul⁵ mentions all the methods to stop the bleeding, *viz.*, pressure, styptics, ligature, escharotics, and cauteries with fire.

Albucasis⁶ mentions four methods of stopping the discharge of blood from an artery :

1. By cautery.
2. By dividing the artery across.
3. By using the ligature.
4. By styptics and bandage.

Avicenna⁷, Rhases⁸ and others also mention these methods

¹ अन्तं मेधादीनां शुष्कान् तौडत्स्यात् शल्यच्छेदानन्तरं सूक्ष्मसिरादिवन्धनादिषु युज्यते ।

Vāgbhaṭārtha Kaumudī, I. xxv.

² तेलेर्द्विभिन्नैर्वहुधा शोनिते प्रसृते भ्रशं ।

कार्थं यद्योक्तं वैदेन शोनितास्थापनं भवेत् ॥

Suśruta Samhitā, IV. i.

³ Celsus, v. 26.

⁴ Galen. Meth. Med. v.

⁵ Paulus Aegineta, IV. lii. vol. II. P. 127. Syd. Soc. Ed.

⁶ Albucasis. Chirrug. i. 58.

⁷ Avicennæ Cantic. ii. 2., and Collig. vii. 23.

⁸ Rhases. Divis i. 39; Contin. xxviii.

for arresting hæmorrhage. Thus it becomes apparent that the use of ligature for stopping bleeding was well known to the ancient surgeons and the present methods of arresting bleeding are only the revival of the old practice. Adams¹ concludes: "It appears, therefore, that the use of the ligature for stopping hemorrhages was well understood by the ancients, and had never been lost sight of even in the darkest ages."

¹ Adam's Commentary on Paul, vol. II. p. 132.

CHAPTER VI.

THE ŚĀSTRA OR THE SHARP INSTRUMENTS.

1. THE MAṆḌALĀGRA OR ROUND HEADED KNIFE.

It is described as a round or circular headed cutting instrument, having a length of six aṅguli. Two sub-varieties are noted—one with a circular edge and the other shaped like a razor (Dallaṇa).¹ Vāgbhaṭa², however, describes the blade to be shaped like the index finger when its nail points towards the palm of the hand. This would then resemble the decapitating hook of Ramsbotham.

It is said to have been principally used for the operation of cutting through and scraping³; so it is recommended to be used

¹ मण्डलनिवाय' यस्य तत् मण्डलाग्रं तच्च द्विविधम् तथाहि—

यदग्रे मण्डलं ब्रूतं चुर संस्थानमेव वा ।

मण्डलाग्रस्य जानीयात् प्रमाणानु षडङ्गुलम् ।

Nivandha Saṁgraha, viii.

² मण्डलाग्रं फले तेषां तर्जन्यन्तर्नखाकृति ।

लेखने क्तेदने योज्यं पोथिकी शुष्किरदिषु ॥

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxvi.

मण्डलाग्रं, मण्डलाग्रं नाम शस्त्रं, फले, फल प्रदेशे, तर्जन्यन्तर्नखाकृति स्यात्, अन्तः, अन्तर्हितो नखः, अन्तर्नखः, तर्जन्या अन्तर्नखः, तर्जन्यन्तर्नखः, तस्मैवाकृति राकारो यस्य तत् तर्जन्यन्तर्नखाकृति । तच्च पोथिकी गलग्रुष्किरदिषु, लेखने, लेखन कर्म्मणि, तथा क्तेदने, क्तेदन कर्म्मणि, योज्यं ।

Vāgbhaṭārtha Kaumudī, I. xxvi.

फलोद्देशे तर्जन्या अन्तर्नखस्तर्जन्यन्तर्नखस्तस्मैवाकृतिर्यस्य तद्विषम् ।

Sarvāṅga Sundarī, I. xxvi.

³ तत्र मण्डलाग्रकरपत्रे स्यातां क्तेदने लेखने च ।

Suśruta Saṁhitā, I. viii.

in the operative treatment of enlarged tonsil¹. It is also advised to be used for piercing the skull of a dead foetus in utero to help its easy extraction by other instruments. So any other presenting part causing difficulty in the delivery of the dead foetus, is to be cut with it. It is claimed that there is less likelihood of damaging the soft parts of the mother by this instrument than by the sharp pointed *vrddhipatra*.²

We find that Suśruta recommends a *maṇḍalāgra* knife in ophthalmic practice for scraping away the membranous expansion in the operation of pterygium³ and other ophthalmic operations,

¹ अङ्गुष्ठाङ्गुलिसन्द' शनाकृष्य गलगुण्डिकां ।

हृदयन्मण्डलायै ण जिह्वोपरि तु संस्थिताम् ।

नोत्कृष्टञ्चैव हीनञ्च विभागं च्छेदयेद्भिषक् ॥

Suśruta Saṁhitā, IV. xxii.

² तत्र स्त्रियमाश्रया मण्डलायै णाङ्गुली शस्त्रेण वा शिरो विदार्य शिरःकपालान्धातुय शङ्कुना गृहीत्वोरसि कचायां व्यपहरेदभिन्नशिरसि चाविफूटे गण्डे वा असंसंसक्तस्थांसदशे बाहुं छित्वा दृतिमिवाततं वातपूर्णोदरं वा विदार्य निरस्थान्धाणि शिथिलीभूत माहरेज्जघनसक्तस्य वा जघनकपालानीति ।

यद्, यदङ्गं हि गर्भस्य तस्य स्वजति तद्विषक् ।

सम्यग्विनिर्हरंश्चित्वा रक्षेत्रारीञ्च यत्नतः ।

गर्भस्य गतयश्चिवा जायन्तेऽनिलकोपतः ।

तत्रानात्ममतिर्बन्धो वर्त्तेत विधिपूर्वकं ॥

नोपेक्षेत मृतं गर्भं मूर्च्छन् मपि पण्डितः ।

सह्याशु जननीं हन्ति निरुच्छासं पशुं यथा ॥

मण्डलायै ण कर्त्तव्यं हृदयमन्तर्विजानता ।

द्विप्रवत् हि तीचायं भारीं हिंसयात् कदाचन ।

Ibid, IV. xv.

³ अस्मै यत् बलीजातं तत्रैतल्लगयेद् भिषक् ॥

अपाङ्गं प्रेक्षमांसस्य वङ्गिण समहितः ।

मुचुष्टाग्रे मेधावी सूचीसूत्रेण वा पुनः ॥

नचोत्थापयता क्षिप्रं कार्यमभ्युन्नतं तु तत् ।

such as for vascular net-work and nodules on the eyeball¹. Cakradatta says² that if the pterygium extends to the black part of the eye, the membrane is to be raised by the point of a needle, transfixed by a vaḍḍiśa or hook, and leaving the pupil free, is to be excised, as Sivadāsa³ explains, by the maṇḍalāgra. He also uses it to scrape away the root of any new growth in the eye⁴ and to perform the operation of scratching in ophthalmic surgery⁵.

शस्त्रपातभयाच्चास्य वत्स नी ग्राहयेद् दृढं ।
ततः प्रशिथिलीभूतं विभिरिव विलम्बितं ।
उल्लिखन्मण्डलाग्रेणः तीक्ष्णं न परिशोधयेत् ॥
विमुक्तं सर्वतथापि कृणाच्छुक्लाच्च मण्डलात् ।
नीत्वा कनीनकोपान्तं क्षिन्द्यान्नाति कनीनकं ॥
चतुर्भागस्थिते मांसे नास्ति व्यपत्तिमहति ।

Suśruta Saṁhitā, VI. xv.

- ¹ सिराजाले सिरायाम्बु कठिनास्ताय बुद्धिमान् ।
उल्लिखन्मण्डलाग्रेण वडिशिनावलम्बितः ॥
सिरासु पिङ्काजाता या न सिध्यन्ति भेषजैः ।
अर्धवन्मण्डलाग्रेण तामाच्छेदनमिष्यते ॥

Ibid.

- ² अर्धं तु च्छेदनीयं स्यात् कृष्णप्राप्तं भवेद्यदा ।
वडिशविज्ञसुन्नम्य विभागश्चाव वर्जयेत् ॥

Cakradatta, Netraroga Cikitsā.

³ अर्धच्छेदनीयमिति मण्डलाग्रेणेति शेषः । सुसन्नम्येति सूच्येणेति शेषः । सूच्येण सुसन्नम्य उत्तोल्य अनन्तरं वडिशेन विज्ञा मण्डलाग्रेण छेदयेदित्यर्थः ।

Tattva Candrikā, Netraroga Cikitsā.

- ⁴ अर्शस्तथावत्सं नाम्ना शुष्काशोऽर्ज्वदमिव च ।
मण्डलाग्रेण तीक्ष्णेण मूलैर्च्छिन्द्याद भिषक् शनैः ॥

Cakradatta, Netraroga Cikitsā.

- ⁵ भिलोपनाहं कफजं पिप्पली मधुसैस्त्वैः ।
विलिखन्मण्डलाग्रेण प्रच्छेदया समन्ततः ॥

* * * *

A small instrument with a broad blade and a rounded cutting tip is figured by Albucasis¹ in connection with ophthalmic work. This was the scalpel for the plastic operation on the eyelid as for trichiasis. Incisions were made by this knife on the eyelids in such a way as to enclose a leaf-shaped area which was then dissected off. The lips of the incisions were then united with three or four sutures². Paul³, quoting Aetius⁴, describes the operation for pterygia :—" Having separated the eyelids, and seized upon the pterygia with a hook-like instrument, having a small curvature, we stretch it, and taking a needle having a horse-hair and a strong flaxen thread in its ear (eye ?), and a little bent at the extremity, we transfix it through the middle of the pterygium, and with the thread we bind the pterygium and raise it upwards, while with the hair we separate and saw as it were the part at the pupil away unto its extremity ; but the remainder of it at the great canthus we cut off from the base with the scalpel used for the operation by suture, but leaving the natural flesh of the canthus, lest there be a running of the eye when it is taken away. Some stretching as aforesaid with a thread, dissect away the whole pterygium with the instrument called pterygotomos, taking care not to touch the corner."

Cakradatta mentions the use of the maṇḍalāgra for scarifying

घृतसैन्धव चूर्णन कफानाहं पुनः पुनः ।

विलिखिन्मण्डलाग्रं प्रच्छेदेद्वा समन्ततः ॥

Cakradatta, Netraroga Cikitsā.

¹ Milne. Greco-Roman Surgical Instruments, Pl. ix. fig. 3.

² Paulus Ægineta, VI. viii.

³ Ibid, VI. xviii.

⁴ Aetius, II. iii. 60.

the tongue for bleeding in the disease called *jihvākāṇṭaka* (prickly tongue)¹. He also uses it in *adhijihvā* or *ranula* and says: "The tongue is to be raised, the *ranula* is to be drawn up and fixed by a sharp hook, and then excised by the *maṇḍalāgra*. Afterwards a strong gargle is to be prescribed".² *Pālakāpya*³ also describes it to have a length of nine *aṅguli*, the handle being six, and the blade three *aṅguli* long. The end is full-moon-shaped and it is directed to be used for scarification on the eyeball.

It seems that *maṇḍalāgra* of different sizes and shapes were used. For the instrument used for perforating the foetal cranium in uterus would scarcely be thought fit for a delicate operation on the eyeball.

Soranus⁴ mentions a special instrument for perforating the foetal head. Rhases⁵ directs us to open the head when the child's cranium is large and cannot be brought down. Haly

¹ कण्टकेषु कफोत्प्लेषु लिखितेष्वृजः चये ।

पिप्पल्यादिर्मधुयुतः कार्यन्तु प्रतिसारणम् ॥

Cakradatta, *Jihvārōga Cikitsā*.

लिखितेष्विति मण्डलायादिना ।

Tattva Candrikā, Ibid.

² उन्नास्य जिह्वामाकृत्य वङ्गिनीनाधिजिह्विकाम् ।

हृदयेन्मण्डलायै य तीक्ष्णोर्ध्वैर्लवणादिभिः ॥

Cakradatta, *Mukharoga Cikitsā*.

³ लेखनं मण्डलाग्रेण कर्त्तव्यं दन्तिनां भवेत् ।

Pālakāpya, III. i.

पूर्णचन्द्राकृत्यायमण्डलायम् लेखनार्थमक्षौ ।

Pālakāpya, III. iii.

⁴ Soranus, II, viii., P. 366.

⁵ Rhases, Cont. xxii.

Abbas¹ also advises us to open the head when it is preternaturally large. Aetius² also gives a similar description. Some authors recommend the polypus-scalpel or the phlebotome in embryotomy. The embryotome figured by Albucasis³ is a straight two-edged blade, and we may conjecture that the mandalāgra used by the Hindus for perforating the foetal cranium was a similar instrument.

2. KARAPATRA OR SAW.

It literally means, "an instrument having the blade in the form of a hand", the fingers being represented by the teeth of the saw. Others explain, as Dallana⁴ points out, the name from its resemblance to a carpenter's saw. It seems that saws of various sizes were used. Susruta mentions its length to be six āṅguli, Vāgbhata⁵ describes it to be ten āṅguli

¹ Haly Abbas, Pract. ix. 57.

² Aetius, XVI. 23.

³ Graeco-Roman Surgical Instruments, Pl. viii. fig. 7.

* करपत्रमिति करवत् पत्रं करपत्रं यथा करोऽङ्गुलिभिराचितो भवति तद्वत् यत् कण्टकैराचितं स्यात्तत् करपत्रमुच्यते । अन्ये तु करपत्रशस्त्रं करपत्राकारमेव तच्च द्वादशाङ्गुलं तन्मान्तरं वचनात् । ननु यदि तन्मान्तरात्तद् द्वादशाङ्गुलं करपत्रमुच्यते तर्हि स्वतन्त्रे विरोधः कुतः स्वतन्त्रे करपत्रस्य निर्दिष्टप्रमाणत्वात् शेषानि तु षडङ्गुलानि इत्यनेन वाक्येन षडाङ्गुलमेव करपत्रम् स्यात् द्वादशाङ्गुलं नैवम् तेषाम् नामाभिरिवाकृतयः प्रायेण व्याख्याता इत्यच्चात् सूत्रात् प्रायः शब्दोऽनुवर्ततेति नायमर्थः, शेषानि प्रायेण षडङ्गुलानि एवं शस्त्रमानेऽन्यच्चाप्यविरोधः ।

Nivandha Saṁgraha, I. viii.

⁵ छेदेऽस्यां करपत्रन्तु खरधारं दशाङ्गुलं ।

विस्तारो द्वाङ्गुलं सूक्ष्मदन्तं स्वतःसह वस्त्रनं ॥

Aṣṭāṅgā Hṛdaya Saṁhitā, I. xxvi.

करपत्राख्यां शास्त्रमाह छेदे इत्यादि करवत् पत्रं यस्या तत् करपत्रं, अङ्गुलिभिराचितो यथाकारो भवति तद्वत् यत् कण्टकैराचितं तत् करपत्रमुच्यते । करपत्रं करात् ख्यातं । करपत्रं खरधारं, खरा, तीक्ष्णा, धारा यस्या तत्तथाविधम्, तथा दशाङ्गुलम्,

long and two aṅguli broad ; while Bhoja¹ alludes to a saw, twelve aṅguli long. The edge of the instrument is described as rough and serrated ; and this is the only instrument that need not have a very sharp edge.

The handle of the saw should be well formed and pegged. Its principal use is to saw a bone. Sometime it is recommended for the purpose of scraping.

Saw is frequently mentioned by the Greek and Roman authors in the descriptions of operations on the bones. Celsus² mentions it in describing the amputation of a gangrenous limb. With reference to fractures of the bones of the head, Paul says³: “ But the mode of operating with saws and the instrument called chœnicides or modioli (trephans ?) is condemned by the moderns as a bad one.” Evidently he means flat cranial saws. Galen⁴ also mentions the “ knife-shaped saws.”

In modern times the saw is still used for identical purposes in surgery.

There is no mention of trephine in Hindu surgery though Jīvaka (500 B.C.) is said to have practised cranial surgery with success⁵. Pandit Vallala describes⁶, in his Bhojaprabandha or

दैर्घ्यं दशाङ्गुलं परिमाणं, तथा विस्तारे द्वाङ्गुलं, परिसरे अङ्गुलद्वयपरिमितं तथा सूक्ष्मं दन्तं सूक्ष्मा दन्ताकारा दन्त यस्य तत्तथाविधं, तथा स्वत्सरवन्धनं, तसरु खड्गादि सुष्टिः बन्धनं, कीलादिना बन्धनं, तसरुश्च बन्धनञ्च ते तसरु बन्धने, शोभने तसरु बन्धने यस्य तत्तथाविधं । तच्च अस्थ्यां छेदि, छेदिन कर्मणि योज्यं ।

Vāgbhaṭārtha Kaumudī, I. xxvi.

¹ See foot-note 4, P. 230.

² Celsus, VII. xxxiii.

³ Paul, VI. xc.

⁴ Galen, XVIII. 331.

⁵ See Mahāvāgga, VIII. 1.18. Sacred Books of the East. Vol. xvii.

⁶ See foot-note 1, p. 60.

Anecdotes of King Bhoja, a surgical operation performed on the king. He was suffering from a severe pain in the head. Medicines did him no good, and so to give relief, surgical interference was thought necessary by two brother surgeons who happened to arrive in Dhar at that time. They are said to have administered a drug called sammohinī to render him insensible. They then trepanned the skull and removed the real cause of his complaint. They closed the opening, stitched the wound and applied a healing balm. They are then said to have administered to the king another drug called sañjibanī to accelerate the return of consciousness.

Trephine was well known to the ancient Greeks and Romans. Hippocrates¹ mentions a trephine or a saw having a circular motion, in the treatment of injuries to the head. Paul also mentions trephine, the use of which is, he says, condemned by the moderns. Sprengel² remarks, that "Galen was averse to the use of the trepan, though he performed the operation on the head occasionally."³

3. VṚDDHIPATRA.

This sharp cutting instrument is called vṛddhipatra from its resemblance to the leaf of a medicinal plant called vṛddhi. Two varieties of this knife are described by Vāgbhaṭa⁴—one is

¹ Hippocrates, III, 371, 374.

² Hist. de la Méd., 18.

³ Adam's Commentary on Paul, VI, xc. Vol. ii., p. 436.

⁴ वृद्धिपत्रं चुराकारं छिद मेदन पाटने ।

ऋज्वयमुक्षते शोऽऽ गन्धरी तु तदग्नया ।

नतायं वृद्धतो दीर्घं ऋज्वक्त्रं यथायथं ॥

straight throughout and it is to be used for opening pointed superficial abscesses; and the other has the end bent or curved. Again amongst the second class of curved knives, some have their ends long and therefore called *dīṅgha-vaktra* or long-mouthed, and these are to be used for opening the deep seated abscesses, while others have their ends short and therefore called *hrasva-vaktra* or short-mouthed, and these are to be used for superficial abscesses that would not point. Suśruta describes them to be six *aṅguli* long. Dallāṇa in his commentary¹ says:—Both the varieties, one with a curved,—and this is called a *kṣura* or razor,—and the other with a resected point, should be seven *aṅguli* long; the handles and the blades should measure five and a half and one and a half *aṅguli* respectively.” These are to be used for cutting through a part, partially or completely, and also for puncturing it.

वृद्धिपदाख्यां शस्त्रमाह वृद्धिपवमित्यादि वृद्धिपवं नाम शस्त्रं, चुराकारं, चुराकृति, चुरश्च लोमच्छेदकः शस्त्रविशेषो नरमुन्दराणां। तच्च वृद्धिनामीषध इत्यस्य पदसदृश फलकवात् वृद्धिपदाख्यं लभते। तद् वृद्धिपवं नाम शस्त्रं वेदे भेदने पाटने च कर्म्मणि योज्यमिति ऋज्वयमित्यादिना विषय विशेषे वृद्धि पदस्याकार भेद उच्यते। यत् वृद्धिपवं ऋज्वयं सरलायभागं, आयतायमित्यर्थः। तत्, उन्नते, उच्छिन्ने, शोके, शोथे, योज्यं। गम्भीरे, भेदे आदि धातुषु शोफे, तथा तदन्यथा, अनुन्नते च शोफे, यत् पृष्ठतः, पृष्ठदेशे नतायं वक्षीभूतायभागं, कुक्षितायमित्यर्थः। तत् वृद्धिपवं शस्त्रं यथायथं दीर्घं ब्रह्म वक्रं, दीर्घं सुखं, ब्रह्म सुखं वा योज्यं। यथायथमिति गम्भीरे शोके दीर्घवक्रं, अनुन्नते च शोके ब्रह्मवक्रमित्यर्थः। अत्र द्विविधं वृद्धिपव शस्त्रयुक्तम्, हे अपि सप्ताङ्गुल प्रमाणे, हयोरपि अर्धपञ्चाङ्गुल हन्तं कार्यं सप्ताङ्गुलं फलमिति। भेदनं, भेदं, एकस्मिन् शरीरदेशे शस्त्रमावगाच्छ अपर दिशा शस्त्रायस्य निष्काशनं भेदनं। पाटनं, विदारणं फाड़न इति लोके।

Vāgbhaṭārtha Kaumudī, I. xxvi.

¹ वृद्धिपवमिति, वृद्धेः पचमिव वृद्धिपवं तच्च द्विविधं एकं अक्षितायं, द्वितीयं प्रयतायं, हे अपि सप्ताङ्गुल प्रमाणे हयोरपि अर्धपञ्चाङ्गुलं हन्तं कार्यं सप्ताङ्गुलं फलम् इति अनयोर्नध्ये अक्षितायं वृद्धिपवं चुरमाहुः।

Nivandha Saṁgraha, I. viii.

One form of the *vṛddhipatra* resembles in shape the razor used by the barbers,—not the English razor that has now become common in Bengal, but the country-made razors which are still used by the barbers in the North-West Provinces.

Suśruta recommends the use of razor, scissors and pinchers for shaving the parts before operation; for “the hairs”, he says, “prevent the healing up of the wound rapidly”¹. He again uses *vṛddhipatra* as a knife and observes:—“If bitten by spiders whose bites are amenable to treatment, the area of the wound should at once be excised out by the *vṛddhipatra*, and then actual cautery applied by the red-hot *jāmvavausṭha* probe till the patient requests for its withdrawal”².

Suśruta uses the *vṛddhipatra* knife for the removal of the scrotal tumour and says³: “The scrotal tumour is to be well fomented and bandaged. The patient should then be cheered up, and leaving the testicles intact, underneath the median raphe, the tumour should be excised by *vṛddhipatra* knife. The fatty tissues being

¹ रोमाकीर्णं व्रणो यस्तु न सम्यगुपरीहति ।
चुरकर्तरीसन्दंशे सप्सरामाणि निर्हरेत् ॥

Suśruta Samhitā, IV. i.

² साध्याभिराभिलुताभिर्दृष्टमावस्य देहिनः ।
वृद्धिपवेण मतिमान् सम्यगादंशमुद्धरेत् ॥
जाम्बुष्ठेनाग्निं तप्तेन दद्देदाकरं वारणात् ।

Ibid, V. viii.

³ सिन्नां चावेष्ट्य पट्टेन समाश्रास्यतु मानवं ।
रुचेत् फले सेवनीच्च वृद्धिपवेण दारयेत् ॥
मिदक्षतः समुद्धृत्य दद्यात् कासीससैन्धवे ।
बभ्रूयाच्च यथोद्दिष्टं ।

Ibid, IV. xix.

removed, powdered ferri sulphas and rock salt are to be dusted over the wound and proper bandages applied."

Vṛddhipatra was also used by the ancient veterinary surgeons. Joyadatta Suri writes¹: "The knife known as vṛddhipatra is shaped like a kṣura or razor. It is three aṅguli long and should be used by the wise to incise a suppurated abscess". In Pālakāpya², we find that "it is ten aṅguli long; the handle being six aṅguli and the blade four aṅguli long and three aṅguli broad. It is used for scission and excision". He uses it also in opening a sinus after well ascertaining its course by means of a probe³.

Hypodermic medication:—The use of hypodermic syringe was not known to the Hindus. They were acquainted however with the hypodermic method of exhibition of drugs. Śārṅgadharma⁴

¹ दशङ्गुलं वृद्धिपत्रं चूराकारं प्रकीर्तितम् ।

पक्षशोयादिषु प्राज्ञः पाटनं तेन कारयेत् ॥

Aśvavaidyaka, XIV. v. 22.

² शस्त्रेण वृद्धिपत्रेण वाऽसि(मि)नेन सि(मि)नेन वा ।

शस्त्रकर्म्मणि निष्पातः सुपक्वं पाटयेद्भिषकः ॥

Pālakāpya, III. iv.

वृद्धिपत्रेण नागानां कुर्याच्छेदनं भेदेन ।

Pālakāpya, III. i.

³ अथ भिषग्यन्त्राधायोक्तेन विधिना सुयन्त्रितं वारणमभिविश्वास्याऽऽय(त्रि)त्य स्तम्भानुगतं गतिमन्तं स्वल्पमुखं नाडीत्रणमेव यथा च विदित्वा वृद्धिपत्रेण शस्त्रेणानुलोमं पृथप्रति, रणार्थ-च्छेदं कुर्यात् ॥

Pālakāpya, III. xv.

⁴ प्रचयिवा चुरेणाङ्गं केवलानिलपीडितम् ।

तत्र प्रदेहं दद्याच्च पिष्टं गुग्गाफलैः कृतम् ॥

तेनाववाहुजा पीडा विपची गृध्रसौ तथा ।

अन्यापि वातजापीडा प्रशमं याति वेगतः ॥

Śārṅgadharma Saṅgraha, III. xi.

directs us to scarify a part with a razor and then apply an ointment of guñjā (*Abrus precatorius*) in sciatica, scrofulous glands of the neck, etc. For treating a person in the state of unconsciousness caused by the derangement of all the humours, he directs us to scarify the anterior fontanelle with a razor, then to apply as much medicine as can be carried on the point of a needle to the part and rub it with fingers¹. The medicine is to be prepared thus :—take aconite 1 pala, quicksilver 1 śāna; mix, and put inside two sorābas or earthen basins smeared with powdered glass and placed face to face. Apply some external application over this and put it on fire for six hours. Then open the basins, take the soot collected on the upper basin and deposit it in a glass vessel quickly to prevent exposure. Caraka² also advises us to apply a medicinal paste on a cranial incision, shaped like

¹ विषं पलानि सृतः शणिकथणं येद्वयम् ।
 तच्चूर्णं सम्पटे च ब्राला काञ्चलितसरावयोः ॥
 सुदां दत्त्वा च संगोष्य ततश्चक्ष्मां निवेशयेत् ।
 वक्त्रिं शनैः शनैः कुर्यात् प्रहसद्वयं संख्यया ॥
 तत उत्प्राप्य तन्मुद्रामुपरिस्थे सरावके ।
 संलग्नी यो भवेद्भ्रमः न गृह्णीयाच्छनैः शनैः ॥
 वायुस्पर्शो यथा नम्यात् ततः कृष्यां निवेशयेत् ।
 रमः सूचीमुखिलशङ्कुष्य निर्याति भेषजम् ॥
 तावन्मात्रे रसो दृश्यो मुर्च्छिते सन्निपातिनि ।
 शरीरे प्रकृतिं मुञ्चति तदङ्गुल्या च घर्षयेत् ॥
 रक्त भेषजं सम्पर्कान्मुर्च्छितोऽपि हि जीवति ।
 तथैव सर्पदंष्ट्रस्त सतावस्थोऽपि जीवति ।
 यदातापो भवेत् तस्य सधुरं तव दीयते ॥

Śarṅgadharā Saṁgraha, II. xii.

² विषद्रूषित कफमारः स्रोतसरोधकइवायुय ।
 सतइव श्चसेन्मर्त्यः सादसाध्यलिङ्गे विह्वीनय ॥

the foot of a crow, in case of snake-bite when he becomes unconscious but his life is not completely despaired of.

4. NAKHA ŚĀSTRA OR NAIL PARER.

Suśruta¹ mentions its length to be eight aṅguli. Dallana² says that its blade is two aṅguli long and one aṅguli broad. Vāgbhata³, on the other hand, describes the length to be nine aṅguli. Arunadatta⁴ thinks it to be a double instrument, one end having a straight edge and the other an oblique one. Some explain⁵ that two different kinds of nakha śāstra—one with a straight and the other with an oblique edge—are directed to be used.

चर्मकषायाः कल्कं विलसमं मूर्ध्नि काकपदमस्य ।

कृत्वा कुर्यात् कटभीं कटुकोटफला प्रधमनञ्च ॥

Caraka Saṁhitā, VI. xxv.

¹ तद नखशस्त्रेऽप्यष्टाङ्गुलं सूच्योक्त्यन्ते ।

Suśruta Saṁhitā, I. viii.

² नखशस्त्रमिति नखानां छेदनाय शस्त्रं नखशस्त्रं तस्य फलं द्वाङ्गुलायामम् एकाङ्गुलं विस्तृतम् ।

Nivandha Saṁgraha, I. viii.

³ वक्रजुंधारं द्विसुखं नखशस्त्रं नवाङ्गुलं ।

सूक्ष्मशल्योद्भुतिच्छेदोद प्रच्छान् लिखने ॥

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxvi.

⁴ नखशस्त्रं नखच्छेदकं प्रसिद्धं । तच्च वक्रा ऋजुधारा यस्य तदेवम् । तस्यैकं सुखं वक्रमन्यदङ्गु स्पष्टम् ।

Sarvāṅgasundarī, I. xxvi.

⁵ नखशस्त्रमाह वक्रजुंधारमि यदि नखानां छेदनाय शस्त्रं नखशस्त्रं तत् द्विसुखं वि द्विः प्रकारं सुखं यस्य तद्विसुखं तथा वक्रजुंधारं एकं वक्रं धारं अपरम् ऋजुधारां स्यात्, तथा नवाङ्गुलं समयोमपि दैर्घ्येण नवाङ्गुलपरिमितं तच्च नखशस्त्रं शल्योद्भुत्यादी योज्यं शल्यानां कण्टकदीनानुद्भुति रुद्धरणं शल्योद्भुतिः प्रच्छानं चिरा इति यस्य प्रसिद्धिः लिखनं चाचम् इति लोके ।

Vāgbhaṭārtha Kaumudī, I. xxvi.

They are principally recommended for cutting, puncturing and scarifying¹; and also for the extraction of needles and minute foreign bodies from the soft parts.

There is no mention of a many-bladed scarificator in the surgical books of the Hindus, but its office was performed by the *nakha śāstra*, in wet cupping, by making parallel incisions close to one another.

Paul² alludes to an instrument compounded of three blades joined in such a way that at one stroke, three scarifications were made; but he prefers a single scalpel for the purpose.

Pālakāpya mentions an instrument called *rampaka*³, having the handle ten *aṅguli* and the blade three *aṅguli* long. It is to be used for paring the nails and cleaning the feet of the elephants.

5. MUDRIKĀ.

It is described to be a cutting instrument of the size of the last phalanx of the index finger⁴; it is also called *aṅguli-śāstra* or finger-knife. *Vāgbhaṭa* describes this instrument but not clearly. He says that the mouth of the *aṅguli-śāstra* looks as if coming out of a ring, and the blade is half an *aṅguli* wide. A ring, having the size sufficient to admit the terminal phalanx of the index

¹ वृद्धिपत्रं नखशस्त्रं मुद्रिकोपलपदकाङ्घ्रौ धारानि कृदने भेदने ।

Suśruta Samhitā, I. viii.

² Paulus Ægineta, VI. xli.

³ रम्पकस्त्राङ्गुलमुखो दशाङ्गुलवत्त पादशोधनार्थं नखच्छेदनार्थं चेति ।

Pālakāpya, III, xxx.

⁴ प्रदेशिन्त्यशपर्वप्रदेशप्रमाणामुद्रिका ।

Suśrutā Samhitā, I. viii.

finger, should be soldered to it. The base of the instrument has a thread tied to it¹.

It is recommended to be used for cutting through neoplasms in the throat. In its uses, Vāgbhaṭa says that it resembles the maṇḍalāgra and vṛddhipatra; and so was sometimes required for perforating the skull of a dead foetus in the uterus of its mother².

Dr. Simpson of St. Andrews (1744) is said to have invented an instrument, a "ring scalpel" for opening the skull. It consists of a loop of steel, through which the finger is to be passed

¹ कुर्यादङ्गुलिशस्त्रकं ।

मुद्रिकानिर्गतमुखं फलेलङ्गुलायतं ।

योगतो हृद्विपवेण मण्डलायेण वा समं ।

तत्प्रदेशिन्ययः पर्वप्रमाणार्पणं मुद्रिकम् ।

सूत्रवद्धं गलस्रोतो रोगक्षेदनं भेदने ॥

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxvi.

कुर्यादित्यादिना अङ्गुलिशस्त्रकं व्यक्ति । मुद्रिका अङ्गुरीयकेण निर्गतं निष्क्रान्तं मुखं यस्य तत्तथाविधं मुद्रिकानिर्गतमुखं तथा फले फलोद्देशे अङ्गुलायतं अङ्गुलिमात्रं विस्तारं अङ्गुलि शस्त्रकं अङ्गुलिनाम शस्त्रं कुर्यात् । तच्च योगतः प्रयोगे हृद्विपवेण मण्डलायेण वा समतुल्यं भवति । लिखने क्षेदने हृद्विपववत् योज्यं किम्वा क्षेदनं भेदनं पाटने मण्डलायवत् योज्यमित्यर्थः । तदित्यादि तदङ्गुलि शस्त्रकं प्रदेशिन्ययः पर्वप्रमाणार्पणं मुद्रिकं कुर्यादिति योज्यं । बैद्यस्य प्रदेशिनी नाम्नी अङ्गुलि सप्तम्या अयं यत्पर्वं तत्तथा तस्य यत् प्रमाणं परिमाणं तदर्पणात् तत् प्रवेशोपयुक्ता मुद्रिका यस्य तत्तथाविधं । मुद्रिका मुदरी आङ्गुली इति वा ख्याता । तथा सूत्रवद्धं मूलदेशे सूत्रेणवद्धं तच्च गलस्रोतो गतानां रोगाणां क्षेदने भेदने च योज्यं ।

Vāgbhaṭārtha Kaumudī, I. xxvi.

² विष्कम्भो नाम तौ मूढौ शस्त्रदारणमङ्गतः ।

मण्डलाङ्गुलि शस्त्राभ्यां तवकर्म प्रशस्यते ।

हृद्विपवं हि तीक्ष्णाय न योनाववधारयेत् ॥

Aṣṭāṅga Hṛdaya Saṁhitā, II. ii.

and from which protrudes a sharp pointed blade about an inch long, by which the cranium was pierced¹.

In the pseudo-Hippocratic treatise² a knife to fix on the thumb and dismember a fetus in utero is mentioned. This knife is called by Turtullian³ the "ring knife", whereby the limbs are advised to be cut off in the womb. It is interesting to point out that *mudrikā* also means a ring.

The veterinary surgeons still use a scalpel blade mounted on a ring⁴, through which a forefinger is passed to dismember foals and calves in exactly the same way.

6. UTPALAPATRA.

This knife is described to have the shape of a petal of the blue lotus. The end is long, sharp and pointed. The *utpalapatra* is *dīrgha-vaktra* or long bladed, while the *arddhadhāra* is the *hrasva-vaktra* or short bladed knife⁵. It is to be used for cutting through and puncturing the parts.

¹ Ed. Med. Essays, vol. V, Part I, P. 445.

² Hippocrates, I. 463.

³ De Anima, 26.

⁴ Græco-Roman Surgical Instruments, Pl. vii. fig. 1.

दीर्घं ऋक्षवक्त्रं यथायथं ।

उत्पलाध्यईधाराख्ये भेदने कृदने तथा ॥

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxvi.

उत्पलपत्राख्याध्यईधाराख्ये शस्त्रे आह उत्पलित्यादि उत्पलश्च अध्यईधारश्च ते आख्ये ययोः शस्त्रयोः से उत्पलाध्यई धाराख्ये शस्त्रे तथा, यथाक्रमं दीर्घं ऋक्ष वक्त्रे भवतः । तच्च उत्पलाख्यं दीर्घवक्त्रं, अध्यईधाराख्यं ऋक्षवक्त्रमित्यर्थः । उत्पलशब्देन उत्पलपत्राख्यं शस्त्रं गम्यते तन्मान्तरदर्शनात् । तस्य फलस्य उत्पलपत्रकारत्वादुत्पलपत्रमिति संज्ञितम् । अधिकमई धारा यस्य तत् अध्यईधारः । हन्तफलयोर्मध्ये फलस्यैव किञ्चिदधिकं दीर्घ्यमिति वर्तते । तच्च अष्टाङ्गुलायतं उरसि अङ्गुलं विस्तरं ।

Vāgbhaṭārtha Kaumudī, I. xxvi.

In the *Aśvavaidyaka*, the *utpalapatra* and *vrihipatra* knives are recommended to be used in puncturing the veins in phlebotomy¹. "The surgeon who is practically acquainted with the methods of puncturing the veins, should use the *utpalapatra* and *vrihipatra* knives for the purpose."

When used for puncturing the large veins the knife is recommended to be encircled with thread at a short distance from the end to prevent unnecessary injury to the vessels by plunging the the knife deeply².

Hippocrates similarly "guards his phlebotome in the surgical treatment of empyema, by having it wound round with a rag, leaving the breadth of the thumb nail at the point."³

Both the *utpalapatra* and *vrihimukha* knives are thus described in the *Aśvavaidyaka*⁴: The "*vrihimukha* knife should be six *anguli* long and half an *anguli* wide. The *utpalapatra* should also be similarly made."

The *utpalapatra* knife is recommended to be used for incising

¹ शस्त्रेणोत्पलपत्रेण वृहिपत्रेण वा भिषक् ।

शिरावेधविधिं सम्यग् दृष्टवन्मा प्रयोजयेत् ॥

Aśvavaidyaka, XIV. v. 23.

² सूत्रकेण च संवेद्य मुखं शस्त्रस्य बुद्धिमान् ।

यथाप्रमाणं संस्थाप्य ततो विस्त्रावयेत् शिराम् ॥

Ibid, XV. v. 35.

³ Hippocrates, II. 258 Kuhn's Ed. and I. 88 Syd. Soc. Ed.

⁴ अर्द्धाङ्गुलन्तु विलीर्णं कूर्चच्छस्त्रं षडङ्गुलम् ।

नाम्ना व्रीहिमुखं सम्यक् तथा चोत्पलपत्रकम् ॥

Aśvavaidyaka, XIV. v. 21.

the abdominal parietis of the horse; then a tube is to be pushed through the wound in the operation of paracentesis abdominis¹.

The phlebotome used by the Greeks is nowhere described in their books; but from considerations of all the various operations to which the instrument was put bears out the fact of its being a sharp pointed, double-edged and straight lancet. The phlebotome of the Greeks might have then resembled in shape the utpalapatra of the Hindus. It was used by the Greeks for various operations besides phlebotomy, as for the opening of abscesses such as the parulis or gum boil², puncture of cavities containing fluid as in opening the abdomen for ascites³, incising the tunica vaginalis as in excision of hydrocele sac⁴ and for dissecting out warts⁵ and sebaceous cysts⁶.

It is interesting to note that Pālakāpya⁷ mentions utpalapatra and describes it to be eight aṅguli long, one and a half aṅguli broad and double edged. He uses it for puncturing vessels etc.

हृदयस्राधरे भागे ऊईभागे च नाभितः ।
अधोवा नाभितः कूर्यच्छेदनं चतुरङ्गुलि ॥
शस्त्रेणोत्पलपत्रेण वामभागे विचक्षणः ।
एकमेवाङ्गुलं शस्त्रं कुचौचापि प्रवेशयेत् ॥
वेधव्रणे ततस्तस्मिन् नालिकां वस्त्रवेष्टिताम् ।
प्रक्षिप्य गालयेद्धारि यावद्द्विकौष्ठलाघवम् ॥

Āśvavaidyaka, LII. vs. 25, 26 and 27.

² Paul, VI. xxvii.

³ Ibid, VI. L.

⁴ Ibid, VI. lxii.

⁵ Ibid, VI. lxxxviii.

⁶ Ibid, VI. xiv.

⁷ त्रीहिसुखप्रमाणमुत्पलपत्रं भेदनार्थं ।

7. ARDDHADHĀRA.

It is difficult to ascertain the exact shape of this knife. Some translate it as a "single edged knife,"¹ but it really means, as Dallāṇa explains, an instrument which has a sharp edge for half the length². It is also called cakradhāra. Vāgbhaṭa has a variant reading—adhyārdhadhāra—which means an instrument having a sharp edge for more than half the length³.

It is eight aṅguli long; the blade is two aṅguli long and one aṅguli wide, and the handle six aṅguli long. It is to be used for incision and division of parts of the body.

8. SŪCĪ OR NEEDLES.

Three needles are recommended to be used for applying sutures. They should be strongly made and rounded in shape. At one end they are flattened, grooved and pierced with an eye for the suture. The groove is said to have been intended to be the bed of the suture during stitching to prevent it from doing any harm to the tissue. In fleshy parts such as the thighs, a three ribbed needle, three aṅguli long, is advised to be used. For less fleshy parts and wounds about the joints, a similar straight needle but two aṅguli long should be employed, while for suturing the wounds of the stomach, intestines, scrotum and the vital parts of the body, preference is given to a needle curved like a bow, two and a half aṅguli long and having the pointed end

¹ Hearnle's Translations of Suśruta Saṁhitā, Bibl. Ind. I. viii.

² अर्द्धधारमिति, अर्द्धं धारा यस्य तत् अर्द्धधारं, चक्रधारमिति प्रसिद्धं तच्च अष्टाङ्गुलायतं चरसि अष्टाङ्गुलं विस्तारं द्वाङ्गुलं फलं । अन्ये त्वध्यर्द्धधारमिति पठन्ति, अधिकमर्द्धं धारायस्य तत् अध्यर्द्धधारम् ।

Nivandha Saṁgraha, I. viii.

³ See foot-note 5, P. 240.

shaped like a paddy. In thickness, these needles are described to be equal to the stalk of the flower of *mālatī* (*Jasminum grandiflorum*). They should have sharp fine points and good shape¹. The needles are also recommended to be used for extraction of foreign bodies from the soft structures and also for evacuating abscesses².

¹ देशं, लम्बांसे सर्वा च सूची वृत्ताङ्गुलद्वयम् ।

आयता वाङ्गुला वा सा मन्त्रिणं वाच प्रजिता ॥

धनुर्वक्रा हिता मर्मफलकोपोदरे, पित्ते ।

इत्येतान्निविधाः सूचीकोलायाः सुसमाहिताः ।

कारयन्मालतीपुष्पवन्तायपरिमण्ड ॥ १८ ॥

Suśruta Samhitā, I. xxv.

वृत्तागृहं दृढाः पाणं चित्रः सूच्योऽथ सौवने ॥

मांसलानां प्रदेशानां वाक्सा वाङ्गुलमायता ।

अल्पमांसस्थि सम्स्थि ब्रणानां वाङ्गुलायता ।

ब्रीहिवक्त्रा धनुर्वक्रा पक्वामायमर्मसु ।

सा साङ्गुलाङ्गुल सर्वा वृत्तास्तथतुरङ्गुला ॥

Aṣṭāṅga Hṛdaya Samhitā, I. xxvi.

तिसृणां सूचीनां विषयविशेषे आकारभेदानाह मांसलानामित्यादि 'मांसलानां' ऊर्ध्वादीनां शरीर प्रदेशानां सौवनार्थं सूची, 'वाक्सा' त्रिकोणविशिष्टा तथा वाङ्गुलमायता, अङ्गुलत्रयदीर्घा कर्तव्या, अस्यास्त्रास्त्रत्व मयभागसौव न तु सर्वावयवस्य । सूचाः सर्वावयवस्य हि साधारणतो वृत्ता कारत्वं निष्पादितगम्यं । अस्या अपि गृहं दृढं पाशत्वं सामान्योक्त्या कथितमेव अल्पमांसलस्थान संस्थितानां, सम्स्थि संस्थितानां च ब्रणानां सौवने वाङ्गुलायता, अङ्गुलिद्वय दीर्घा, सूचीकर्तव्यं, पक्वामये, आमामये तथा 'मर्मसु' वस्त्रादिषु संस्थितानां ब्रणानां सौवने, ब्रीहि वक्त्रा, पाटलादि ब्रीहिवक्त्रा, 'धनुर्वक्रा' धनुर्वक्राकारा या सूची साङ्गुलाङ्गुला, अङ्गुलाधिक वाङ्गुल दीर्घा योज्येति योज्यं अत्रापि गृहं दृढं पाशत्वं योजनीयं । साङ्गुलाङ्गुल्यन्तेन च्छेदः । सर्व्वेत्यादि परेण सम्बन्धते ॥

Vāgbhaṭṭārtha Kaumudī, I. xxvi.

² सूचीकुशपदाटीमुखशरीरौमुखान्तमुखविकूचकानि विस्वावणे ।

Suśruta Samhitā, I. viii.

In modern times, the surgeons use fully curved, half-curved and straight surgical needles. Waring¹ remarks: "The shape of the needle which ought to be used for closing an incision depends upon the depth and accessibility of the wound. In deep wounds, or wounds which are not readily accessible, curved needles will be found to be most useful, while for shallow cuts straight needles will be most convenient."

Suśruta makes mention of a javamukhī needle² (*iit.* having the sharp end shaped like a barley corn) for passing a double ligature smeared with escharotic ointment, across the base of a tumour in opposite directions. Then by cutting through the nooses, and tying together the contiguous ends of the ligatures, the whole of the growth is encircled and strangled by them, exactly in the same way as in modern times a naevus is ligatured by means of a naevus needle. Cakradatta also quotes this description of the method of extirpating tumours by ligatures.

Erichsen says³: "When the tumour is small, an ordinary double ligature may be passed across its base, by means of a common suture needle; and the noose being cut and the thread tied on each side, strangulation will be effected. When it is of larger size, and of round shape, the most convenient method is that recommended by Liston. It consists in passing, by means

¹ Manual of Operative Surgery. By H. J. Waring, M.S., M.B., Third edition, P. 42.

² अश्विंदादिषु चोत्क्षिप्य सूत्रं सूत्रं निधापयेत् ।

सूत्रीभिर्धववक्राभिराचितं वा समन्ततः ।

सूत्रं सूत्रेण वध्नीयाच्छिन्नं चोपचरेदन्नयम् ॥

Suśruta Saṁhitā, IV, xvii.

Cakradatta, Nāḍivraṇacikitsā.

³ Erichsen's Surgery, Vol. II, P. 73.

of long nævus needles, fixed in wooden handles, and having their eyes near their points, double whipcord ligatures in opposite directions beneath the tumour; then cutting through the nooses, and tying together the contiguous ends of the ligatures until the whole of the growth is encircled and strangled by them."

There are many instances of the use of surgical needle by the Greek and Roman Surgeons. Needles of different sizes are recommended. Celsus mentions a large needle in describing the operation of suturing the abdominal parietis¹, and another, evidently a small needle, which is said to have been used in the treatment of staphyloma of the cornea². The needles were either round or three-cornered. "A few three-cornered needles of Roman origin have been found, although they are rare" (Milne³). Paulus uses a needle in suture of the upper eyelid, and other modes of operating for trichiasis⁴, for the repair of wounds of the peritoneum⁵, and recommends a large sized needle containing a double thread to close the peritoneum in the operation for enterocele⁶.

Pālakāpya mentions sūcī or needles for stitching wounds⁷. They are eight aṅguli long, shaped like the tusk of an elephant and are either three ribbed, or four ribbed, or round, smooth and

¹ Celsus, VIII, xvi.

² Ibid, VII. vii.

³ Greco-Roman Surgical Instruments, P. 75.

⁴ Paulus Ægineta, VI. viii.

⁵ Ibid, VI. lii.

⁶ Ibid, VI. lxxv.

⁷ सूची सेवनाय । अष्टाङ्गुलं नागदन्ताकृति । त्र्यष्टा चतुरष्टा वा दृढा समाहिता यथा शलाका वने वल्गविधृत्यम् ।

strong. He reserves curved three-cornered needles for fleshy parts and round needles for skin, veins, nerves and arteries¹.

Caraka recommends the use of leeches, knife and needles for extracting blood from the piles². He also advises us to use needles for pricking the patches of leprous spots³ before the application of leeches for extracting blood.

9. KUŚAPATRA.

It is a form of knife resembling in shape the leaf of a kuśa grass (*Poa cynosuroides*)⁴. The instrument should be six aṅguli long (Suśruta) ; the blade measuring two aṅguli (Vāgbhaṭa)⁵

- १ याःसूचस्त्रिविधाः प्रोक्ताः शस्त्राध्याये संस्थिताः ।
 नागदन्ताकृतिर्हृत्ता विकोणा चेति निश्चयात् ॥
 अस्थ्याश्रितं नागदन्त्या मांसजं च विकोणया ।
 त्वकस्त्रायु धमनीस्थं च शिराजं चैव वृत्तया ।
 आहार्ये सर्व्वयन्त्राणां सूच्या सीवनमिष्यते ॥

Pālakāpya, III. i.

- २ जलौकीभिः तथा शस्त्रैः सूचीभिर्वा पुनः पुनः ।
 अवर्त्तमानं रुधिरं रक्ताश्रयिभिः प्रवाहयेत् ॥

Caraka Saṁhitā, VI. ix.

- ३ प्रच्छिन्नमस्यं कुष्ठं विरेचयेद्वा जलौकाभिः ।

Ibid, VI. vii.

- ४ कुशपत्रमिति, कुशपत्रतुल्यं कुशपत्रं तन्मानमाह :—

अङ्गुलैरुचकं विद्यादङ्गुलं फलसुच्यते ।
 इतः स्यात् वृङ्गुलं मध्ये कुशपत्रस्य लक्षणम् ॥

Nivandha Saṁgraha, I. viii.

- ५ कुशाटी वदने आये वृङ्गुलं स्यात्तयोः फलं ॥

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxvi.

कुशाटीवदने हे शस्त्रे, स्वाये विस्वाद्य विषये योज्ये । तयोः कुशाटी वदनयोः
 फलं वृङ्गुलं, वृङ्गुलद्वयं परिमितं स्यात् ।

Vāgbhaṭārtha Kaumudī, I. xxvi.

and the handle four aṅguli, but according to Bhoja, the handle is three aṅguli long. It is to be used for draining pus from abscess. The handle has a ring like ornamentation, about one aṅguli in diameter. Another variant reading describes the blade, the ring, and the handle to have the lengths of two, three, and two aṅguli respectively. This would make the total length of the instrument to be seven aṅguli; so evidently there is some lapsus calami in the second reading.

Cakradatta uses kuśapatra as a bleeding lancet and says¹: "Out of the twelve vessels that lie on the sides and underneath the tongue, select the two large bluish vessels on either sides of the tongue, raise them up by vaṛīśa or hook and puncture them by the kuśapatra knife and then, after bleeding, apply a paste of treacle and ginger to the wound". In the Yogaratnākara², the author advises us to adopt this method of bleeding, in the treatment of tumours in the neck.

Pālakāpya mentions kuśapatra and describes it as being shaped like a kuśa grass³. It is nine aṅguli long—the handle being

¹ जिह्वायाः पार्श्वतोऽधस्तां शिरा द्वादश कीर्तिताः ।

तासां स्थूलशिरि कृण्वे विध्यात् ते तु शनेः शनैः ॥

वडिशिषेव संगृह्य कुशपत्रेण बुद्धिमान् ॥

Cakradatta, Galagāṇḍa Cikitsā.

² जिह्वाधः पार्श्वयोर्मूलाच्छिरा द्वादश कीर्तिताः ।

तासां स्थूल शिरि द्वे च च्छिन्द्यात्ते च शनेः शनैः ।

वडिशिषेव संगृह्य कुशपत्रेण बुद्धिमान् ।

सुते रक्ते ब्रूये तस्मिन् दद्यात्तस गृहमाद्रकम् ॥

Yogaratanākara, P. 321.

³ नवाङ्गुलं कुशपत्रं । पञ्चाङ्गुलं वृत्तं । चतुरङ्गुलम् पत्रं । अध्यार्धाङ्गुलविक्षृत-
सुभयतो धारं । कुशपत्राकृति गन्धिरपाकभेदनार्थं षड्ङ्गुलं वृत्तम् अध्यार्धाङ्गुलं पत्रं ।

Pālakāpya, III. xxx.

five or six aṅguli and the blade four aṅguli long. The blade is one and a half aṅguli wide and is sharp-edged on both sides (*i.e.*, double-edged). It is used for incising deep abscesses.

10. ĀṬĪMUKHA.

This instrument is described to have the shape like the beak of the jalavardhanī bird or āṭī¹ (*Turdus ginginiamus*),—a bird living in the marshes. It is six aṅguli long; the blade measuring two and the handle four aṅguli. So it is of the same size as the kuśāpatra to which it also resembles in function. Bhoja is of opinion that its blade is one and the handle seven aṅguli long.

11. ŚARĀRĪMUKHA.

This instrument is a pair of scissors resembling the face of the long beaked bird called śarārī. Dallāṇa describes two varieties of the bird, one with white shoulders, and the other with a red head. It is the former kind which is referred to here². Suśruta describes its length to be ten aṅguli³, while Dallāṇa mentions the length to be twelve aṅguli.

¹ आटीमुखमिति, आटी जलवर्द्धनी नाम पक्षिविशेषः तन्मुखवन्मुखं यस्य तत् आटीमुखं तथाचोक्तं :—

बलं सप्ताङ्गुलं विद्यात् तस्यै फलमिष्यते ।

आटीमुख प्रकारं हि फलमङ्गुलमायतम् ।

Nivandha Saṁgraha, I. viii.

² शरारीमुखमिति, दीर्घचक्षुः पक्षिविशेषः स द्विविधः धवलकन्धः रक्तशीर्षश्च धवलकन्धस्य शरारीति संज्ञा तन्मुखवन्मुखं तस्य शस्त्रस्य लोके कर्त्तरीति संज्ञा ताच्च द्वादशाङ्गुलां चलत्पलसां कुर्यात् ।

Ibid.

³ दशाङ्गुला शरारीमुखी सा कर्त्तरीति कथ्यते ।

Suśruta Saṁhitā, I. viii.

It is recommended to be used for evacuating abscess¹, etc. Suśruta mentions karttarī as a synonym but Vāgbhaṭa counts it as a separate instrument. He describes karttarī as a pair of scissors used by the barbers for clipping hair and is said to have been necessary for dividing the nerves, ligaments and fine hairs².

12. ANTARMUKHA.

Suśruta describes another variety of scissors, used principally for evacuating abscesses. It is so named, for its straight cutting edges are within its curved claws³. It is said to be six aṅguli long and one and a half aṅguli broad⁴. It seems that the curvature of the blade varied widely; and Vāgbhaṭa describes a variety called

¹ स्नाय्वे शरार्थासाविक्कृच्चिके ।

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxvi.

स्नावे विस्त्रावनविषये कर्मणि शरार्थासा विक्कृच्चिके इे शस्त्रे योज्यः । तच्च शरार्थास्य शरारीमुखं शरारी दीर्घचक्षुः पक्षिविशेषः तस्य मुखवदासं यस्य तत् शरार्थासां, तच्च चलत्फलं दशाङ्गुलं दीर्घं कार्यम् ।

Vāgbhaṭārtha Kaumūdī, I. xxvi.

² स्नायु सूक्ष्म कचच्छेदे कर्तरी कर्तरीनिभा ।

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxvi.

कर्तरीशस्त्रमाह स्नायुत्यादि कर्तरीनामशस्त्रं कर्तरीसदृशं तच्च स्नायुच्छेदने सूक्ष्मकेश-च्छेदने च योज्यम् । कर्तरी काटारी इति यस्य प्रसिद्धिः ।

Vāgbhaṭārtha Kaumūdī, I. xxvi.

³ अन्तर्मुखमिति मध्यमुखं तल्लक्षणमाह—

अष्टाङ्गुलप्रमाणेन जिह्वाधारेण चायुतम् ।

शस्त्रमन्तर्मुखं नाम चन्द्राङ्गं इव चोद्भूतम् ।

Nivandha Saṁgraha, I. viii.

⁴ तद्वदनर्मुखं तस्य फलमध्यैर्मङ्गुलं ॥

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxvi.

arddhacandrāṇan¹ or “half-moon faced” scissors in which the blades are curved like the half-moon. It has the length of eight aṅguli, the blade measuring one and a half aṅguli. This is also to be used for letting out pus from abscesses.

Hārīta, however, mentions a śāstra, called also arddhacandra or half-moon, but he recommends its use for excising the prolapsed arms of a dead foetus to effect its delivery². This instrument can not but be a knife, for it seems difficult to cut off the arm, even of a foetus, with a pair of scissors. Moreover, antarmukha has never been credited with the power of excising the arm.

13. TRIKŪRCCAKA.

It has been translated in English as a thin-edged sharp instrument or trocar. Wise, Dutt and Hoernle agree to mean by it a trocar. But it can be better explained if we understand by the term an instrument consisting of three needles fixed on a round

अपरच्च विस्वावण शस्त्रमाह तद्वदित्यादि तद्वत् कुशटीवदनवत्, अन्तर्मुखं अन्तर्मुखं नाम शस्त्रं स्वाय्ये योज्यं तस्य अन्तर्मुखस्य फलं अध्यङ्गमङ्गलं स्यात् । आधि अधिकं अर्द्धं अध्यङ्गं । सार्द्धं कमङ्गलमित्यर्थः ।

Vāgbhaṭārtha Kaumūdī, I. xxvi.

¹ अर्द्धचन्द्राननं चेत् तथाध्यङ्गमङ्गलं फले ॥

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxvi.

अन्तर्मुखस्य प्रकारमेदमाह अर्द्धचन्द्राननमित्यादि एतत् अन्तर्मुखं, अर्द्धचन्द्राननं अर्द्धचन्द्राकारमुखस्य भवति, तदपि तद्वत्, कुशटीवदनवत् स्वाय्ये योज्यं । तच्च फले अर्द्धमङ्गलं अर्द्धमङ्गलपरिमाणं फलमित्यर्थः । अर्द्धचन्द्राकारमुखत्वात् अस्य शस्त्रस्यापि अर्द्धचन्द्राननमिति संज्ञेति बोध्यं ।

Vāgbhaṭārtha Kaumūdī, I. xxvi.

² अथवा अर्द्धचन्द्रेण शस्त्रेणैव मृतगर्भस्य बाहुयुगलं सञ्चिद्य बाह्वनिःसारयेत् ।

Hārīta Saṁhitā, III, li.

wooden handle¹. According to Suśruta, the length of the instrument is six *aṅguli*. But others describe it as eight *aṅguli* long, the blade and the handle measuring three and five *aṅguli* respectively². The distance between the edges is the breadth of a grain of rice. The end of the handle is ornamented with a circular metallic plate as a ring.

It is recommended to be used for evacuating abscesses and for draining blood from the nasal polypus.

Caraka³ mentions an instrument called *kūreca* and says:—
“After fomenting and thus softening the rounded nodules (of leprosy) which are fixed and hard, by heated stones and fumigations through tubes, they are to be injured by the *kūreca* and the blood that oozes out, should be wiped away.”

Two other instruments are described by Vāgbhaṭa as being constructed on a similar principle. One is named *kūreca* and the

¹ चिकृञ्चकमिति त्रयः कृञ्चा यस्य तत् विकृञ्चकम् । कृञ्चः कृञ्चौ इति लोके ।

Vāgbhaṭārtham Kaumūdī, I. xxv.

² विकृञ्चकमिति त्रयः कृञ्चा यस्य तत् विकृञ्चकम् तत्र तन्वान्तरम् :—

अङ्गुलानि तथाष्टौ च शस्त्रं कार्यं चिकृञ्चकं ।

फलैरन्तर्मुखाकारैर्वङ्गुलैरन्वितं विभिः ।

एकेकस्य फलस्यैषामन्तरं ब्रीहिसन्धितम् ।

इत्तं पञ्चाङ्गुलायामं कार्यं रुचकभूषितम् ॥

Nivandha Saṁgraha, I. viii.

³ स्थिरकठिनमण्डलानां स्निग्धानां प्रस्तरप्रणाङ्गीभिः ।

कृञ्चैर्विचटितानां रक्तोत्कृष्टशोषनेतव्यः ॥

Caraka Saṁhitā, VI. vii.

other, khaja. The kūrcca¹, he describes as an instrument "consisting of seven or eight rounded sharp needles, four aṅguli long, nicely bound together by a cord and tightly fixed on a circular wooden handle." He mentions its use in the operation of scratching to cure baldness and the brown and black spots on the face. For scarifying a bald spot, Cakradatta² uses needles, rough leaves, etc. "The khaja³," Vāgbhaṭa continues, "consists of eight rounded needles having the sharp ends half an aṅguli long. It is to be introduced

¹ कूर्चोवृत्तैक पीठस्थाः सप्ताष्टौ वा सुवन्धनाः ।

संयोज्य नीलिका व्यङ्ग केश शतेषु कुट्टने ॥

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxvi.

सम्पत्ति कूर्चाख्यं शस्त्रं लघ्नितुमाह सर्व्वेत्यादि ताः सूत्र्यः सर्व्वेव वृत्ताः वर्त्तुलाः तथा चतुरङ्गुलाः चतुरङ्गुलदीर्घाः कृच्चः इत्युच्यन्ते । ताः सूत्र्यः पुनः कौटुशाः ? वृत्तेकपीठस्थाः वृत्तं वर्त्तुलि एकस्मिन् पृष्ठे संस्थिताः, एकं वृत्ताकारं काष्ठफलकं परिवेष्ट्य स्थिता इत्यर्थः । तथा सप्तसंख्यका अष्टसंख्यका वा, तथा शोभनं रज्ज्वादिकृतं बन्धनं यासां तास्तथाविधाः सुवन्धनाः । स कृच्चः नीलिकादिषु रोगेषु कुट्टने कुट्टनार्थं संयोज्यः प्रयोज्य इत्यर्थः । कुट्टनं आच्छादन इति लोके । नीलिकादयो वक्ष्यमाणा केशशतः केशानां पतनं ।

Vāgbhaṭārtha Kaumūdī, I. xxvi.

² अवगाढपदञ्चैव पुच्छयित्वा पुनः पुनः ।

Cakradatta, Kṣudhraroga Cikitsā.

अवगाढपदमिति गम्भीरपदं यथास्यात् तथाः सूचीनखरञ्ज्यादिभिः पुच्छयित्वा * * *

Tattva Candrikā, ibid.

³ अर्द्धाङ्गुलसुखैर्द्वैतरेष्टाभिः कण्टकेः खजः ।

पाणिभ्यां मध्यमाग्नेन प्राणाग्नेन हरेदष्टक् ॥

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxvi.

खजसंज्ञकशस्त्रमाह अर्द्धाङ्गुलसुखैरित्यादि अर्द्धाङ्गुलप्रमाणं सुखं येषां ते अर्द्धाङ्गुलसुखा सौवर्द्धाङ्गुलसुखेः वृत्तैः वर्त्तुलैः अष्टाभिः अष्टसंख्यकेः कण्टकेः कृतं शस्त्रं खज उच्यते । तेन खजाख्येन शस्त्रेण पाणिभ्यां हस्ताभ्यां मध्यमाग्नेन आलोच्यमाग्नेन प्राणात् नासिकायाः अष्टकरक्तं हरेत्, निर्हरेदित्यर्थः ।

Vāgbhaṭārtha Kaumūdī, I. xxvi.

into the nostrils and turned to and fro with both hands to bleed the nasal polypi."

The Greeks and Romans used a similar instrument for identical purpose. It was called *katiádion*, measuring a blade of grass, and was used for opening abscesses of the womb and tonsils, drawing blood from the inside of the nose and perforating the fetal cranium.

In India, the practice of drawing blood from the nasal polypus by blades of grass is still in vogue; and Aræteus mentions it as a common mode of scarification in ancient Greece also¹. "On the next day we are to abstract blood from the inside of the nostrils, and for this purpose push into them the long instrument named *Katiádion*, or the one named *Toryne*, or in want of these we must take the thick quill of a goose, and having scraped the nervous part of it into teeth like a saw, we are to push it down the nostrils as far as the ethmoid cells, then shake it with both hands, so that the part may be scarified by its teeth. Thus we shall have a ready and copious flow of blood; for slender veins terminate there and the parts are soft and easily cut. The common people have many modes of scarification, by rougher herbs and dried leaves of the bay, which they introduce with the fingers and move strongly." Paul² opens the vessels in the nostrils with the reed called *typha*.

14. KUTHĀRIKĀ.

It is a small instrument shaped like an axe, so called from its resemblance to *kuthāra*, an axe which is still used in India

¹ Extant works of Aræteus, P. 460.

² Paul, vol. II. Sec. lx.

for cutting wood¹. Vāgbhata says² that “the base of the blade is thicker and broader than the end and is fitted to a handle, seven and a half aṅguli long. The blade which is shaped like the tooth of a cow, has the width of one aṅguli.” Bhoja describes the width of the blade to be a half aṅguli³. It is recommended to be used for puncturing vessels in the following manner⁴:—“Hold the handle with the left hand and put the blade on the vessel resting on a bone. Raise the instrument a little upwards and then strike over the thick base of the blade with the downward strokes of the middle or index finger, when let go

¹ For figure of Kuṭhāra as used in Ancient India, see Pl. xxii in Ferguson's Tree and Serpent Worship.

² पृथुः कुठारी गोदन्तसदृशार्द्धाङ्गुलानना ।

तथोर्द्धदण्ड्या विधेदपर्यस्थ्यां सिरां स्थितां ॥

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxvi.

कुठारिका संज्ञकं शम्भमाह पृथुरित्यादि कुठारी पृथुः स्यात् । कुठारिका नामशस्त्रं पृथुः स्थूलमूलं स्यादित्यर्थः । तथा गोदन्तसदृशार्द्धाङ्गुलानना गवां दन्तः गोदन्तः सत्सदृशं तुल्याकारं अर्द्धाङ्गुलायतं आननं मुखं यस्याः सा तथा विवया तथा कुठार्या ऊर्द्धदण्ड्या अस्थ्यां उपरिस्थितां सिरां विधेत् । तदण्डं वामहस्तेनोन्नीक्रुष्य कुठार्यामुखं शिरोपरि संस्थाप्य दक्षिणाङ्गुष्ठतर्जनीभ्यां कुठारिकामस्तकमभिहत्य सिरां विधेत् ।

Vāgbhaṭārtha Kaumūdī, I. xxvi.

³ कुठारिकेति कुठारतुल्या कुठारिकाः—

कुठारिकाया हन्तं स्यात् सार्द्धसप्तार्ङ्गुलायतं ।

फलमर्द्धाङ्गुलायामं गोदन्तसदृशं समम् ॥

Nivandha Saṁgraha, I. viii.

तथा मध्यमयाङ्गुल्या वैद्योऽङ्गुष्ठं विसृज्य ।

ताडयेदुत्थितां ज्ञात्वा स्पर्शादवाङ्गुष्ठं पीडयेत् ॥

कुठार्या लघयेन्मध्यं वामहस्तं गृहीतया ।

फलोद्देशे सुनिष्कम्पं शिरां तद्वच्च मोचयेत् ॥

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxvii.

forcibly from the under surface of the thumb". Cakradatta¹ also advises us to use it in a similar manner. To open the veins in fleshy parts, Vāgbhaṭa recommends the vrihimukha knife, while the kuṭhārikā is advised to be used in venesection on bony structures.²

Pālakāpya³ mentions the kuṭhāra and describes its shape to be like an axe. It is to be used for excision and scarification. He describes another śāstra called vatsadanta (*lit.*, the calf's tooth); it is ten aṅguli long; and the mouth of the instrument is one and a half aṅguli broad. It is also to be used for excision.

"Bleeding from the jugular vein, he (Albucasis) describes much in the same way that it is now practised by veterinary surgeons, namely, by placing a sort of scalpel bent at the point, which he calls fissorium, upon the vein, and striking the instrument with a hammer or some such body. He gives drawings of variously shaped lancets for opening the veins of the arm."⁴

"Ferriers bleed with a fleam, which, though apparently a clumsy method of operating, is certainly safer than the lancet in

¹ वामहस्तेन विन्यसा कुठारौमितरेण तु ।

ताडयेन्मध्यमाङ्गुल्याङ्गुष्ठविष्टम्भसुक्तया ॥

Cakradatta Śīrāvyaḍdhādhikāra.

² मांसली निक्षिपेद्देशे व्रीहासं व्रीहिमावकम् ।

यवाहंसस्थामुपरि शिरां विध्वन् कुठारिकाम् ॥

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxvii.

³ कुठाराकृतिं कुर्यात् । कुठारौ शस्त्रपच्छेदनार्थं । वत्सदन्ताकृतिं वत्सदन्तं दशाङ्गुलम् ।
एकेकमध्यङ्गुलसुखम् । एवमेतानि च वीर्यपि यथायोगं प्रच्छेदार्थं ।

* * * * *

कुठाराकृतिशस्त्रेण ततस्तं प्रच्छेदयिष्यक् ।

नातिगार्दं न च लघुं न घनं विरलं न च ॥

Pālakāpya, III. iii.

* Albucasis Chirrug. ii. 97; also see Adam's Commentary on Paul, VI. lx. 323,

unknown hands." "In bleeding with a fleam, the near side is most convenient. In skilful hands, there is no occasion for a blood stick, as the fleam may be struck with the right hand if it is made broad and round at the back. It also may be made much smaller and neater than that generally employed". There is a drawing of such an improved fleam which much resembles in appearance the kuṭhārī of the Hindus. "A fleam is rather more convenient instrument in bleeding, either from the arm or thigh, as the vein is somewhat apt to roll when a lancet is used."¹

15. VRĪHIMUKHA.

It is described as a kind of trocar², the sharp end being pointed and shaped like a grain of paddy. It is six aṅguli long, the handle being two and the blade four aṅguli (Bhoja). But Vāgbhaṭa³ describes the length of the blade to be one and a half aṅguli.

It is advised to be used for paracentesis abdominis in abdominal dropsy. Suśruta says :⁴ "The friends of the patient should

¹ White's Compendium of the Veterinary Art, 1851, 18th ed. P. 342.

² व्रीहिमुखमिति व्रीहिमुखमिव मुखमस्य व्रीहिमुखं तव भोजः—

शस्त्रं व्रीहिमुखं कार्यमङ्गुलानि षडायतम् ।

द्वाङ्गुलं तस्य वृत्तं स्यात् तत्फलं चतुरङ्गुलम् ।

तन्मुखं व्रीहिविलारं तनुसंगुदकण्टकम् ॥

Nivandha Saṅgraha, I. viii.

• 3 * * * तयाध्यर्हाङ्गुलं फले ।

• व्रीहिवक्त्रं * * *

Aṣṭāṅga Hṛday Saṁhitā, I. xxvi,

⁴ उदकोदरिणस्तु वातहरतैलाभ्यक्तस्योषोदकस्निग्धस्य स्थितस्यानैः सुपरिगृहीतस्याकक्षात्-
परिवेष्टितस्याधो नाभेर्ध्वागतस्तुरङ्गुलमपह्नाय रोमराज्या व्रीहिमुखेनाङ्गुलीदरं प्रमाणमवगाढं
विध्यते ॥

Suśrutā Saṁhitā, IV. xiv.

hold him under the axilla. - Then the abdomen is to be tapped by the vrihimukha knife at a point, four aṅguli distant on the left side from the median line, underneath the navel." Vāgbhaṭa¹ advises us to surround a broad bandage round the abdomen before tapping it by the instrument, which he recommends to be introduced up to one aṅguli. Cakradatta² refers to works on surgery for the surgical treatment of ascites. A small incision is directed to be made before the puncture.

In the Aśvavaidyaka, for this operation, the utpalapatra knife is recommended; an incision four aṅguli long is directed to be made above or below the navel of the horse, and then the end of the knife is to be plunged into the abdominal cavity up to one aṅguli.³ The vrihimukha is also advised to be similarly used.⁴

Hippocrates speaks of evacuating the fluid in paracentesis abdominis with an instrument which Camper thinks must have been a kind of trocar.⁵

सज्जले जठरे तैलेरभ्यक्तस्यानिलापहैः ।
 स्निग्धस्याणाम्बुना कलमुदरे परिवेष्टिते ॥
 वद्वक्त्रिद्रोदितोस्थाने विध्यैदङ्गलमाचकम् ।
 निधाय तस्मिन्नाङ्गीञ्च स्वावयेर्द्धमध्मसः ॥
 अथास्य नाङ्गीमाकृष्य तैलेन लवणेन च ।
 ब्रणमभ्यज्य वद्धा च वेष्टयेद्वाससोदरम् ॥

Aṣṭāṅga Hṛdaya Samhitā, IV. xv.

² जातं जातं जलं स्वायं शास्त्रोक्तं शस्त्रकर्त्रे च ।

Cakradatta, Udaracikitsā.

³ See foot-note, 1. p. 242.

⁴ See foot-note, 4. p. 241.

⁵ See the Commentary on Paul, By Adams, vol. II, P. 338.

It is also to be used for puncturing the vessels in phlebotomy (Vāgbhaṭa)¹ especially in the fleshy parts of the body.² Cakradatta uses vṛihimukha in phlebotomy and says: "The sharp end of the vṛihimukha should be kept under the palm between the thumb and index finger and is to be thrust into the seat of puncture."³

Suśruta directs us to use it in tapping the hydrocele:⁴ "Then the hydrocele is to be wrapped round with a bandage. The fluid is next to be drained by tapping it with a vṛihimukha on the lower part of the scrotum, little externally to the suture."⁵ Similar directions are given in the Yogratnākara.⁶ Cakradatta also gives a similar description.⁶

¹ ब्रीहिवक्त्रं प्रयोज्यच्च तत्सिरोदरयोर्वध्येः ।

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxvi.

ब्रीहिमुखस्थं शस्त्रं चाह ब्रीहिवक्त्रमित्यादि ब्रीहवक्त्रमिव वक्त्रं यस्य तत् ब्रीहिवक्त्रं । ब्रीहिमुखं यत्शस्त्रं तत्सिरानां व्यधे व्यधने तथा उदरस्य जलोदरस्य व्यधे स्नावणार्थं योज्यं ।

Vāgbhaṭārtha Kaumudī, IV. xxvi.

ताडयन् पीडयेच्चैनां विध्येद् ब्रीहिमुखेन तु ।

Aṣṭāṅga, Hṛdaya Saṁhitā, I. xxvii.

² मांसले निःक्षिपेद्देशे ब्रीहासं ब्रीहिमात्रकम् ।

Ibid.

मांसलेष्ववकाशेषु यवमात्रं शस्त्रं निदध्यादतो हन्यैष्वर्द्धयवमात्रं ब्रीहिमात्रं वा ब्रीहिमुखेन ।

Suśrutā Saṁhitā, IV. viii.

³ ततो ब्रीहिमुखं व्यध्यप्रदेशे न्यस्य पीडयेत् ।

अङ्गुष्ठतर्जनीभ्यास्तु तलप्रच्छादितं भिषक् ॥

Cakradatta Śīrṣyādhādhikāra.

⁴ See foot note 5, P. 123.

⁵ संस्वेद्य मूलप्रभवं वस्त्रखण्डेन वेष्टयेत् ।

सौवर्णा पार्श्वतोऽधस्ताद्विध्यैत् ब्रीहिमुखेण वै ॥

Yogarātnākara.

⁶ संस्वेद्य मूलप्रभवां वस्त्रपट्टेन वेष्टयेत् ।

सौवर्णाः पार्श्वतोऽधस्ताद्विध्यैत् ब्रीहिमुखेण वै ॥

Chakradatta Vṛddhi Cikitsā.

Paul describes the operation but he recommends a sharp-pointed knife or lancet instead of a trocar. He says: "Wherefore we must make the patient stand erect; or if this can not be done, we must cause him to be seated; * * *. We give orders to the assistants standing behind to press with their hands and push downwards the swelling to the pubes. Then taking a sharp-pointed knife or lancet, if dropsy be among the intestines, in the perpendicular line of the navel, and about three fingers' breadth distance from it we divide the hypogastrium as far as the peritoneum."¹ Celsus mentions that some perform it at a spot four fingers' breadth below the navel in the left side, and recommends us to use a perforator, the point of which should be about the size of the third part of a fingers' breadth.² Vegetius, the veterinary surgeon, recommends paracentesis for the dropsy of cattle.³ The Arabic authors Avicenna,⁴ Serapion,⁵ Albucasis,⁶ Haly Abbas,⁷ and Rhases,⁸ give similar descriptions.

In modern times, we perform the operation in the same way. "It is necessary in certain conditions to tap the abdomen in order to withdraw fluid which has accumulated there and this is usually done by means of a special trocar and canula. The site for tapping is selected, the usual spot being in the middle line, half-way between the umbilicus and the pubes. A

¹ Paulus Ægineta, Bk. VI. l. Syd. Soc. Ed.

² Celsus. vii. 15; ii. 10.

³ Vegetius. Mulom. iii. 25.

⁴ Avicenna, iii. 14; iv. 13.

⁵ Serapion. iv. 7.

⁶ Albucasis: Chirrug. ii. 54.

⁷ Haly Abbas, Pract. ix. 41.

⁸ Rhases, Cont. xix.

small puncture about one-third of an inch long is made with the knife at the spot selected. The trocar and canula to which the rubber tubing is attached, are then thrust through the abdominal wall into the peritoneal cavity."¹

The Greeks did not describe the operation of tapping the hydrocele. They always preferred the open incision to puncture. Paul uses a knife for making the skin incision, but when the tunica vaginalis is laid bare, he divides it through the middle with a lancet for bleeding.² Some of the Arab authors mention the operation of puncturing the serotum for hydrocele. If the patient be timid, and do not choose to submit to open incisions, Albucasis advises the surgeon to let out the water either with a scalpel or the instrument used for tapping in dropsy. He states, however, that the water will collect again after this operation.³ Rhases also describes this operation.⁴

In modern times, trapping for hydrocele is still practised. "When trapping a hydrocele the patient should be sitting up in a chair * * *. The serotum, having been cleansed, is grasped from behind by the left hand * * *. A spot, free from any large veins, is selected on the anterior and lower part of the swelling, and the trocar and canula introduced with sharp stabbing movement."⁵

Pālakāpya⁶ describes vrīhimukha as shaped like a grain of paddy and recommends it for scission and excision of muñja.

¹ Operations of General Practice. By Corner and Pinches. P. 109, 2nd ed.

² Paulus Aegineta, VI. lxii.

³ Albucasis. Chrug. ii. 62.

⁴ Rhases. Cont. xxiv.

⁵ Operations of General Practice, P. 145.

⁶ 'सवण' पाटन' चैव कुर्याद्ब्रह्मसुखेण तु ।

16. ĀRĀ OR AWL.

It is a long sharp needle in handle, so called from its resemblance to the shoe-maker's instrument known as awl. "It has a total length of sixteen aṅguli, with a sharp end of the size of a sesamum seed. The handle is tapering like a cow's tail and is equal in circumference to the young stem of Dūrvā (Unodon Dactylon)" (Bhoja)¹. Suśruta mentions its length to be six aṅguli. Vāgbhaṭa describes the length to be one aṅguli, the basal half being round, and the terminal half, four cornered and sharp pointed. The terminal part is introduced into the inflammatory swellings to confirm the diagnosis of suppuration. It is also to be used to drain the congested blood vessels in the matrix of the nails as a result of traumatism².

¹ अरिति, अरिव आरा असिः चर्मकाराणां शस्त्रं । तव तन्वान्तरम् :—

आरा द्वाष्टाङ्गुल्यामा कर्त्तव्या तु विशाम्पते ।

तिलप्रमाणन्तु फलं तस्याः कार्यं समाहितं ।

दुर्व्याङ्गुरपरीणाहं हन्तं मोपुच्छसन्निभं ।

Nivandha Saṅgraha, I. viii.

² व्यधने कर्णपालीनां यूथिका मुकुलानना ।

आराङ्गाङ्गुल वृत्तास्या तत्प्रवेशे तथोद्भूतः ॥

चतुरस्रा तथा विष्टेच्छीथं पक्कामं संशये ।

कर्णपालीच्च वहलां वहलाया न च शस्यते ॥

सूत्रा विभागशुधिरा द्वाङ्गुला कर्णवेधनी ।

Aṣṭāṅga Hṛdya Saṁhitā, I. xxvi.

सम्प्रति कर्णपालि व्यधन योग्यानि शस्त्राणि वक्तुमाह व्यधने इत्यादि कर्णपालीनां कर्णलतानां व्यधने व्यधनविषये यूथिका यूथिका नाम शस्त्रं योज्यं । कीदृशी ? मुकुलानना मुकुलवत् प्रकृतत्वात् यूथिका मुकुलवत् आननं मुखं यस्याः सा तथाविधा । आरित्यादि अर्द्धाङ्गुलं परिमाणं वृत्तं वर्तुलं आस्यं मुखं यस्याः सा तथा अर्द्धाङ्गुलवृत्तास्या, तथा स एव अर्द्धाङ्गुलप्रमाणः प्रवेशः प्रवेशनं यस्याः सा तथाविधा तत् प्रवेशा तथा ऊर्ध्वतः वृत्ताङ्गाङ्गुलादुपरिष्ठात् तथा अर्द्धाङ्गुल परिमाणैव चतुरस्रा चतुष्कोणा सा आरा कथ्यते ।

It is also said to have been used for perforating a thick lobule of the ear, though for this purpose another instrument called *karna-vedhanī* or ear-perforator—a needle specially meant for perforating the lobules of the ears,—is mentioned. It is three *aṅguli* long, having a slit or eye in the three-fourths of its length. The barbers used a similar needle to perforate the ears on the ceremony of tonsure.

For piercing the lobule of the ear, another instrument is mentioned. It is called *jūthikā*, from its end resembling in shape the conical bud of *jūthikā* flower (*Jasminum Auriculatum*).

Suśruta uses *ārā* or *pāṇimantha* to perforate the bone in diseases of the medullary canal caused by the obstructed and deranged air¹. He next introduces one end of a tube open at

एतेन आरायाः फलं एकाङ्गुलपरिमितमिति फलति तव प्रथमाङ्गाङ्गुलं द्वत्तमपराङ्गाङ्गुलं चतुरस्रं तयोरुभयभागयोर्मध्ये अग्रस्थयतुरस्त्री भागः प्रवेशयोग्य इति सूचितं । तथा आराया पक्कमं संशये अयं शोथः पक्कं आसीवेति संशये सति तादृशं शोथं विधेयत्, तथा वहलां अतिमांसलां कर्णपालीचं तथा विधेयदिति योज्यं । वहलामित्यन्तेन श्लेढः । वहलायामित्यादि वहलायाः अतिमांसलायाः कर्णपाल्याः व्यधने कर्णवेधनी नाम्नी सूची च शस्यते । कीदृशी ? विभागशुषिरा, विभागः शुषिरं ग्रन्थं यस्याः सा तथाविधा विभागशुषिरा तथा वाङ्गुला अङ्गुलवयदीर्घा । न केवलमारा वहलायाः कर्णपाल्या व्यधने शस्यते अपि तु कर्णवेधनी नाम्नी सूची च शस्यते इत्यर्थः । कर्णवेधनीं सूचीं अस्मदंशीया नरमुन्दरा कर्णवेधनार्थं व्यवहरन्ति । अतोऽपि बाहुल्यवर्णयेति ।

Vāgbhaṭārtha Kaumūdī. I. xxvi.

¹ निरुद्धेऽस्थिनि वा वायी पाणिमन्थेन दारिते ।

नाडीं दत्वास्थिनि भिषक् चूषयेत् पवनं वली ॥

Suśruta Samhitā. IV. iv.

निरुद्धे इत्यादि । त्वडमांसं शस्त्रेण विपाद्य अस्थि पाणिमन्थेन अराशस्त्रेण विद्धा तव रग्ने दिमुखीं नाडीं प्रणिधाय मुखमारुतं चूषणेन लवनापकर्षणं करणीयमिति ।

Nivandha Saṁgraha. IV. iv.

both ends into the canal through the hole in the bone, while through the other end the surgeon sucks out the air by his mouth.

For perforating the ears of the elephants, a similar needle is recommended by Pālakāpya. It is known as karmāra or nālī.

17. VETASAPATRAKA.

It is a long sharp cutting instrument shaped like the leaf of the rattan (*Calamus Rotang*). Its edge is finely serrated and very sharp. The blade and handle are equal in length, measuring four *aṅguli*. Bhoja says: "The blade is one *aṅguli* wide"¹. It is said to have been used for puncturing vessels in phlebotomy².

18. VADĪŚA OR SHARP HOOK.

In shape it is described to resemble the ordinary fish-hook. Bhoja describes the total length to be six *aṅguli*, its hook being half an *aṅguli* and its handle five and a half *aṅguli* long. The end is bent; the curvature varies and may be shaped like a half-moon³.

¹ वेतसपत्रमिति, वेतसपत्रमिव वेतसपत्रमत्र भोजः—

तौष्णमाङ्गुलं विस्तारं चतुरङ्गुलायतं ।

अङ्गुलानि तु चत्वारि ब्रून् कार्यं विज्ञानता ॥

Nivandha Saṁgraha, I. viii.

² वेतसं व्यधने ।

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxvi.

वेतसपत्रादि शस्त्रमाह वेतसमित्यादि वेतसं वेतसपत्रं नामशस्त्रं सिरादीनां व्यधनं कर्मणि-
योज्यं । वेतसपत्रवद्गुणस्त्वस्य वेतसं वेतसपत्रं वेत्ति संज्ञा ।

Vāgbhaṭārtha Kaumūdī, I. xxvi.

वडिशमिति वडिशतुल्यं वडिशं मत्स्रावेधनीमाहः । तत्र तन्मान्तरं :—

वडिशे चापि कर्त्तव्ये प्रमाणे तु षडङ्गुली ।

स्नातन्तु तयोरिकेनैकं नाव्यायतं भवेत् ।

Suśruta says¹ : The end of the hook is sharply edged and is said to have resembled the new leaf of Java (*Hordeum vulgare*).

It is recommended by Suśruta² to be used for extraction of foreign bodies, *e.g.*, the extraction of stone from the urethra. Its use is also mentioned for transfixing the membranous expansion in the operation for pterygium³ and for fixing and dragging the uvula and tonsil before the performance of any operation on these parts⁴. Cakradatta⁵ mentions its use for fixing a growth, before its excision by the knife.

अर्द्धापचाङ्गुलं बलं शेषं कार्यं सुखं तयोः ।

अर्द्धचन्द्राकृतिं वक्रं कार्यं नात्यानतस्य तु ।

स्नानतं नामयेत् तव वडिशञ्चभिषग्वरः ।

बलाययोरन्तरं स्याद् यावदर्द्धाङ्गुलं मतं ।

Nivandha Saṁgraha, I. viii.

¹ वडिशोदन्तशङ्कुश्यानताये तीक्ष्णकण्टकं प्रथमयवपत्रसुखे ।

Suśruta Saṁhitā, I. viii.

² यदृच्छया वा मुचसार्गप्रतिपन्नान्तरासक्तां युक्राग्नरीं शर्करां वा स्वीतसा अपहरेत् एवं चाशक्ये विदार्य वा नाडीं शस्त्रेण वडिशनीद्वरेत् ।

Suśruta Saṁhitā, IV. vii.

³ यहणेयुष्टिकाम्बार्द्धवडिशः सुनताननः ॥

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxvi

वडिशशस्त्रमाह यहणे इत्यादि मुष्टं नतं अङ्गुश्वत् नसकृतं आननं सुखं यस्य स तथाविधः सुनताननः वडिशं मत्स्वविधनवत् वडिशोनाम शस्त्रं स्यात् । स च युष्टिकाम्बार्द्धयहणे योज्यं । अदिपदेण उपजिह्विकादि परिग्रहः ।

Vāgbhaṭārtha Kaumūdī, I. xxvi.

• पिङ्गकामुत्तमाख्याच्च वडिशनीद्वरेद्विषक् ।

• उज्ज्वलं मधुसंयुक्तैः कषाद्यैर्वचूर्णयेत् ॥

Suśruta Saṁhitā, IV. xvi.

⁵ उत्तमाख्यानपिङ्गकां संक्रिय वडिशोद्धृताम् ।

Cakradatta, Sukradoḥa Cikitsā.

It was also used for fixing any growth in the eye, previous to its excision by the *maṇḍalāgra*¹. For this purpose the Greeks used the *vulsellum* (*myzon*). Aetius says: "If there is a large and malignant excrescence in the angle of the orbit, the enlarged part must be seized with *vulsella* and cut off."²

Evidently *vaḍiśa* was used on many occasions when in modern times we use the dissection forceps to steady a part before excision.

Vaḍiśa is described in the *Aśvavaidyaka*³ to have been similarly used during the operation of *pterygium* in horses.

*Pālakāpya*⁴ mentions *vaḍiśa* which is described as eight *aṅguli* long, the end being rounded like a wheel. It is to be used for raising the membranes of the eye globe.

Sharp hooks were used by the Greeks and Romans, for similar purposes. The use of the sharp hook for fixing the *pterygium* is mentioned by Celsus⁵, Aetius⁶, Paul⁷ and Albucasis⁸.

Its use in the excision of the tonsil is mentioned by Paul⁹. After the patient being placed in the proper position, he narrates: "We take a hook (*tenaculum*) and perforate the

¹ See foot notes 1, 2 and 3, P. 227.

² Aetius, vi, 74.

³ चितौ निपात्य तुरगं ततोर्गव' प्रसारयेत् ।

कृतकर्मो भिषग्विद्वान् वडिर्जनाच्चिवर्त्तनि ॥

Aśvavaidyaka, XXX. v. 32.

⁴ वडिश् चक्रायमष्टाङ्गुलप्रमाणमङ्गोः पटलोद्धरनाथं चेति ।

Pālakāpya, III. xxx.

⁵ Celsus, VII. vii.

⁶ Aetius, Tet. ii, iii, 60.

⁷ Paul, VI. xviii.

⁸ Albucasis, Chirrug. ii, 16.

⁹ Paul, VI. xxx.

tonsil with it, and drag it outwards as much as we can without drawing its membranes along with it, and then we cut it out by the root with the scalpel suited to the hand, called ancyлотomus, for there are two such instruments, having opposite characters”.

19. DANTA ŚĀṆKU OR TOOTH-SCALER.

. Its head is half an aṅguli long. It is quadrangular in shape and has a sharp edge. Suśruta ¹ describes the end as slightly bent, sharp and shaped like the fresh leaf of Java. Bhoja ² describes the end to be like that of the vṛihimukha.

Vāgbhaṭa³ describes a similar instrument called dantalekhana or tooth-scaler. It is also quadrangular in shape, one side being sharp-edged and the opposite side little lengthened. It is

¹ See foot note I. P. 265.

² एवं हि क्रियते एतौ दशशङ्कुर्विज्ञानता ।
 शङ्कु वच्च मुखं तस्य कार्यमङ्गुलायतम् ॥
 चतुरस्रं समञ्चेव तीक्ष्णधारं समाहितं ।
 वृत्ताय तस्य कर्तव्यं शस्त्रं व्रीहिमुखाकृति ।
 कपालिकां शर्कराञ्च दन्तस्थानेन शोधयेत् ॥

Nivandha Saṁgraha, I. viii.

³ एकधारं चतुष्कोणं प्रवृद्धाकृति चैकतः ।
 दन्तलेखनकं तेन शोधयेद्दन्तशर्करान् ॥

Aṣṭāṅga Hīdaya Saṁhitā, I. xxvi.

दन्तलेखनं शस्त्रमाह एक धारमित्यादि एका धारा यस्य तत् एकधारं चत्वारः कोणा यस्य तत् चतुष्कोणं कोणः कोणा इति यस्य प्रसिद्धिः तथा एकतः एकदेशात् प्रवृद्धा वर्धनशीला आकृतिः आकारो यस्य तत्तथाविधं प्रवृद्धाकृति दन्तलेखनं दन्तलेखनाख्यं शस्त्रं स्यात् तेन दन्तलेखनाख्येन शस्त्रेण दन्तशर्करान् दन्तनिवृद्धान् शर्कराण्यान् लेखयेत् कर्शयेदित्यर्थः । दन्तालिख्यन्ते अनेनेति दन्तलेखनं दन्तशर्करा पाथरि इति लोके ।

Vāgbhaṭārtha Kaumūdī, I. xxvi.

recommended to be used for the extraction of sordes and tartar from the teeth ¹.

The procedure of the operation of tooth-extraction is not described in detail in the medical books of the Hindus. But the operation seems to have been well known, for Suśruta distinctly advises the students to practise the operation of extraction on the fruits of Panas (Atrocarpus Integrifolia), Vimbi (Cephalandra Indica), Vilva (Egle Marmelos) and on the teeth of the dead animals ². He also advises us to extract the wisdom teeth and to apply cautery to their sockets ³. Also when a tooth becomes loose he directs us to extract it and apply cautery to the socket ⁴. In the treatment of sinus caused by carious tooth, he advises us to extract the tooth, otherwise the sinus would extend down to the inferior maxillary bone ⁵.

¹ शस्त्रेण दन्तवैदर्भं दन्तमूलानि शोधयेत् ।

* * * *

अहिंसन् दन्तमूलानि शर्करामुदरेद् भिषक् ।

Suśruta Samhitā, IV. xxii.

² See foot note 2, P. 280.

³ उद्धृत्याधिकदन्तान् ततोऽग्निमवचारयेत् ।

कृमिदन्तक-वच्चापि विधिः कार्यो विज्ञानता ॥

Suśruta Samhitā, IV. xxii,

⁴ चलमुद्धृत्य च स्थानं विदहच्छुधिरसा च ।

Ibid.

⁵ यन्दन्तमधिजायित नाङ्गी तंदन्तमुद्धरेत् ।

कृत्वा सांसानि शस्त्रेण यदि नोपरिजोभवेत् ॥

शोधयित्वा दह्नेदपि चारेण ज्वलनेन वा ।

भिनत्युपेक्षिते दन्ते हनुकास्थि गतिध्रुव ॥

समलं दशनं तस्मादुद्धरेद् भग्नमस्थि च ॥

उद्धृतेतन्त्रे दन्ते सशले स्थिरवत्सने ॥

Pālakāpya¹ mentions the extraction of tooth of the elephant by means of enīpada which is an iron bar, thirty-two aṅguli long and equal to the tooth in circumference.

Paul says² : “The laminae which unite to them (the teeth) we may remove as may appear proper, with the concave part of a specillum, a raspatory, or a file.” The operation of tooth-extraction was however, not liked by the ancient Greeks as cases in which the operation proved fatal, occurred in their practice. Caelius Aurelianus, Herophilus, and Galen disapprove in general of the operation, except in extreme cases.

It would, no doubt, be interesting to know that in ancient India, the Hindus knew how to make false teeth to be used by men who have lost them either by accident or by extraction by the dentists. In 1194 A.D., Sahabuddin defeated Jayacandra in battle, “and the incident of the body of the rāja being recognised by his false teeth³—a circumstance which throws some light on the state of manners” is well known.

20. EṢAṆĪ OR SHARP PROBES.

“The probes”, says Caraka⁴, “are of two kinds, the hard or

¹ द्वाविंशदङ्गुलायतदशनपरिनाहिन लौहदण्डेन ।
एनीपदेन कुर्यादुद्धरणं तयोः सम्यक् ॥
ब्रीहिसुखेन च परिशोध्य सर्व्वस्तस्या दन्तमूलेषु ।
उत्थादकधीतेषु मधुसर्पिः पूरणं दद्यात् ॥

Pālakāpya, III. xviii.

² Paul. VI. xxviii.

³ Elphinstone's History of India, P. 365, 5th Ed.

⁴ द्विविधमेषणां विद्यामृद्बीजं कठिनामपि ।
उद्भिदैश्च दृभिर्नालेर्लोहानां वा शलाकया ॥
गन्धौरमांसगे देशे पात्रे लौहशलाकया ।
एथं विद्याद् व्रणं नालेविपरीतमती भिषक् ॥

Caraka Saṁhitā, VI. xiii.

metallic probes, and the soft probes such as the young stems of plants. The hard probes are required for deep sinuses in the fleshy parts and the sides of the body, while the softer varieties are used for probing the superficial sinuses". The ends of the probes are generally shaped like the head of the earth-worms¹. Suśruta² describes them to be eight *āṅguli* long. They are to be used as probes to ascertain the direction of sinuses.³ The blunt probes have been described before under the *śālākās*.⁴

The sharp probes have the shape of a needle and are six *āṅguli* long. The other end carries an eye through which is put one end of a caustic thread (*i.e.*, thread soaked in caustic lotion and then dried). The probe is to be used for piercing the tissues through the blind end of the sinus. The end of the thread is next to be withdrawn from the eye of the probe and a tight knot applied with the other end. The intervening bridge of tissues is thus gradually cut and the sinus opened. If the cord be found inefficient for the purpose, a second thread is to be tied similarly.⁵

¹ एषणी गण्डुपदाकारमुखी ।

Suśruta Saṁhitā, I. viii.

² तत्र नखशस्त्रं घण्ट्यावष्टाङ्गम् ।

Ibid.

³ गतेरन्वेषणे श्लक्ष्णा गण्डुपदमुखेषणी ।

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxvi.

एषाण्यस्य शस्त्रमाह गतरित्यादि एषणीनाम शस्त्रं गतेः नाडीनृणस्य पूयादिपथस्य अन्वेषणे अन्वेषेचने योज्यं । सा चैषणी श्लक्ष्णा कीमलस्पर्शा, तथा गण्डुपदमुखा, महीलता मुखाकार मुखा च भवति ।

Vāgbhaṭāṛtha Kaumūdī, I. xxvi.

⁴ See page 155-7.

⁵ कण्डुर्वलभीरूणां नाडीमर्म्मप्रिताच या ।

वारसूत्रेण तां किन्द्यान्न तु शस्त्रेण बुद्धिमान् ॥

This method of treatment is recommended for the weak and timid patients. The needle-shaped probe is also to be used in the extirpation of new growths by means of caustic threads. Cakradatta¹ also describes this operation; evidently he copies it from Suśruta. In the Yogaratnākara² the verses describing the operation are also quoted. Vāgbhaṭa also mentions a needle-shaped probe for the same purpose.³

In treating of fistula-in-ano, Paul quotes from Hippocrates and says⁴ :—"For Hippocrates directs us to pass a raw thread,

एषण्णा गतिमन्विष्य चारसूत्रानुसारिणीम् ।
 सूचीं निदध्याद्गत्यन्ते तथोन्नम्यायु निर्हरत् ॥
 सूत्रस्यान्तं समानीय गाढवस्त्रं समाचरेत् ।
 ततः चार वलं बीज्य सूत्रमन्यत् प्रवेशयेत् ॥
 चाराक्तं मतिमान् वैद्यो यावन्नच्छिद्यते गतिः ।
 भगन्दरेऽप्येष विधिः कार्यः वैद्येन ज्ञानता ॥
 अश्वुदादिसु चोत्क्षिप्य मूले सूत्रं निधापयेत् ।
 सूचौभिर्यावदक्ताभिराचितं वाः समन्ततः ।
 मूले मूत्रेण वध्नीयाच्छिन्ने चोपचरेद्भ्रणः ॥

Suśruta Saṁhitā, IV. xvii.

¹ These verses are quoted in the Cakradatta, Nāḍivraṇa Cikitsā.

² Also quoted in the Yogaratnākara, P. 346.

³ भेदनार्थेऽपरा सूचीमुखा मूलनिविष्टत्वा ।

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxvi.

अपरमयेषणो शस्त्रमाह । भेदनार्थं इत्यादि भेदनार्थं नाडीव्रणानां गतिभेदनार्थं अपरा पूर्वोक्तया एषण्णा अन्त्या सूचीमुखा सूत्राकार सुखा स्यात् तथा मूले मूलदेशे निविष्टं, सूत्रनिवेश योग्यं खं छिद्रं यस्याः सा मूलनिविष्टत्वा मच्छिद्रमूलमित्यर्थः । अस्या एषण्णामूले छिद्रकरणं चारक्तसूत्रनिवन्धनार्थं । तेन प्रभिन्न हारनिकाशितेन दृढवस्त्रेण चारमूत्रेण नाडीव्रणः प्रकाश्यते ।

Vāgbhaṭārtha Kaumūdī, I. xxvi.

⁴ Paul. VI lxxviii.

consisting of five pieces, through the fistula by means of a probe having a perforation, or a double headed specillum; and to tie the ends of the thread and tighten it every day until the whole intermediate substance between the orifices be divided and the ligature fall out". Hippocrates ¹ describes minutely the apolinose and recommends it for those who from timidity avoid a surgical operation. Celsus recommends the thread to be smeared with some escharotic ointment. The process, he says, is slow but free from pain². Albucasis ³ also approves of the operation according to circumstances. The operation called apolinose *i.e.*, by the ligature, is very celebrated. Ambrose Pare, Foubert, Camper, Giudo de Cauliaco and Rogerius approve of the ligature. It has been recommended by some of the modern surgeons⁴. The operation is still practised in India by the Madras specialists for fistula-in-ano.

Vāgbhata ⁵ describes copper probes having the sharp ends shaped like the buds of Kuravaka (*Baleria Cristata*) to be used in

¹ Hippocrates. 'De Fistulis'.

² Celsus, vii. 4.

³ Albucasis. *Chirurg.* ii. 80.

⁴ *Lancet*, vol. I. 1845, new series.

⁵ ताम्बी शलाका द्विमुखा मुखे कुरवकाकृतिः ।

लिङ्गनाशं तथा विध्येत् ॥

Aṣṭāṅga Hṛdaya Saṁhitā. I. xxvi.

शलाका शस्त्रं अङ्गुलि शस्त्रं वाह ताम्बीत्यादि द्विमुखा, द्विद्वारा, मुखे, मुखप्रदेशे कुरवका कृतिः, रक्तभिण्डीपुष्प मुकुलकारा, ताम्बी, ताम्रमयी, शलाका, शलाका शस्त्रं स्यात् । तथा शलाकाया लिङ्गनाशं, कफोत्थं पटल संचकं चक्षुरोग विशेषं विध्येत् । विध्येत्यनेन क्लृप्तः ।

the operation of cataract. Suśruta¹ describes such a probe to be eight aṅguli long, made of copper, or iron, or gold, the ends being shaped like buds. A thread is spirally twisted round the middle of the instrument for a length of a thumb's breadth, to afford a firm grasp by the surgeon's fingers. This instrument must not be rough, thick or very sharp, for then there would be a greater chance of the eye being injured more than is necessary and at many places. So also in couching of cataract, Celsus says: "Then a needle is to be applied, sharp so as to penetrate, but not too fine."²

Pālakāpya³ mentions eṣaṇī in the surgical treatment of diseases of the elephants. He describes three probes,—smooth and shaped like the collyrium rods. They are recommended to be ten, twenty and thirty aṅguli long respectively.

- ¹ शलाका कर्कशायूखरा दोषपरिप्लुतिं ।
 त्रयं विशालं स्थुलाभा तीक्ष्णा द्विसादनकेषा ॥
 जलास्त्रावन्तु विषमा क्रियासङ्गमथास्थिरा ।
 करोति वर्जिता दोषैस्तस्यादिभिर्हिता भवेत् ॥
 अष्टाङ्गुलायता मध्ये सूत्रेण परिवेष्टिता ।
 अङ्गुष्ठ पर्वसमिता वक्रयोर्धुक्कुला कृतिः ॥
 ताम्बायसी शतकौश्वी शलाका सप्तादनिन्दिता ।

Suśruta Saṁhitā, VI. xvii.

² Celsus. VII. viii.

- ³ स्थिरा मृद्वी च कर्तव्या व्रणानामिषणी भवेत् ।
 वृत्ता गच्छुपदमुखी प्रमाणे विंशदाङ्गुली ॥
 सुवर्णरूप्यताम्रानामायसी शृङ्गजाऽपि वा ।
 दन्तास्थिवेनुदारुणामिषणी दारुणा भवेत् ॥

Pālakāpya, III. i.

एषणी दशाङ्गुला विंशत्यङ्गुला विंशदङ्गुला यथायोगमञ्जनशलाकाकृतिं सुखतः क्षुब्ध्वा समा
 चैवमेतास्त्रिंश एषण्यः प्रमाणतः कार्य्याः ।

Ibid, III. xxx.

The operation of couching for cataract is essentially an Indian operation; and Suśruta describes the operation minutely as follows :—

The operation of couching for cataract.

Suśruta says¹ : “Now we shall describe the treatment of cataract caused by phlegm. If inside the crystalline lens, anything is seen like a half-moon-shaped drop of water or pearl, hard, irregular

४ श्लेष्मिके लिङ्गनाशे तु कर्म वच्चासि सिद्ध्ये ।
 नचेदङ्गेन्दुघर्ष्मान्बुबिन्दुमुक्ताकृतिः स्थिरः ॥
 विषमो वा तनुर्ध्वे राजिमान्वा बहुप्रभः ।
 दृष्टिस्थो लघ्वाने दोषः सर्जना वा सुलोद्धितः ॥
 क्षिप्तस्त्रिभुजस्य तस्याथ काले माल्युष्णशैतले ।
 यन्त्रितस्योपविष्टस्य स्वाग्नासां पश्यतः समः ॥
 मतिमान् शुक्लभागी वै कृष्णाम्बुक्ताक्षपाङ्गतः ।
 उन्मूल्य नयने सम्यक् शिराजालं विवर्जिते ॥
 नाधो नोर्ध्वं पार्श्वोर्ध्वां छिद्रे देवकृते ततः ।
 शलाकया प्रयत्नेन विश्वस्तं यववक्त्रया ॥
 मध्यं प्रदेशिन्यङ्गुष्ठस्थिरहस्तं गृहीतया ।
 दक्षिणेन भिषक् सव्यं विध्येत् सव्येन चैतरत् ॥
 बारिविन्हागमः सम्यक् भवेच्छब्दस्तथा व्यधे ।
 संसिष्य विह्वलान्मनु योनिस्तन्मेन कोविदः ॥
 स्थिरे दोषे चले वापि स्वेदयेदक्षिं बाह्यतः ।
 सम्यक् शलाकां संस्थाप्याभ्यङ्गैर निलानाशनैः ॥
 शलाकायेण तु ततो निर्वृत्तिं दृष्टिमण्डलं ।
 विध्यतो योऽन्य पार्श्वेऽन्धत्वं रुद्धा नासिकापुटं ॥
 उच्छिद्धानेन हतं व्यो दृष्टिमण्डलजः कफः ।
 निरुध इव घर्ष्माण्यर्थादा दृष्टिः प्रकाशते ॥
 तदासी लिखिता सम्यग् ज्ञेया याचापि निर्व्यथा ।
 ततो दृष्टेषु रूपेषु शलाकामाहरेच्छनैः ॥

or thin, striated or shining, painful or red, caused by the deranged humours, the oleaginous applications and fomentations are to be tried first at a time when it is neither hot nor cold ; then he (patient) is to be ligatured after having him seated conveniently, and should be directed to look towards his own nose. The intelligent (surgeon), then separating the white part from the black part and the external canthus of the eye after opening it, avoiding the vascular network, and leaving the parts above and below intact, is to pass a yavamukhī śālākā (or sharp needle having its end resembling a wheat) through a natural opening on the side, steadily holding the rod with the thumb, index and middle fingers. If the operation be required on the right eye, the left hand, and if on the left eye, the right hand of the surgeon should use the needle in puncturing. A successful puncture is known by the escape of a drop of fluid and an audible sound. The experienced surgeon is to sprinkle woman's milk just after the puncture, and keeping the needle there, whether the deranged humour be movable or not, should apply fomentations externally by means of oily remedies for the deranged air. The crystalline lens is next to be scarified by the sharp end of the needle. Then keeping the needle fixed in the side of the eye, the patient should be directed to sniff so as to destroy the phlegm of the lens. The proper scarification will be indicated when the lens appears brilliant as the sun uncovered by clouds. Then the vision being clear, the needle in the side of the eye, is to be removed ; and the eye is to be well

घृतेनाभ्यज्य नयनं पद्मपट्टेन वेष्टयेत् ।

ततो गृहे निरावाधे शयितोत्तान एव च ॥

soaked with ghee (melted butter) and bandaged properly." Vāgbhaṭa also describes the operation similarly.¹

To this we may compare the account of the operation as given by Celsus. He "lays it down as a rule, that when the suffusion is small, immovable, and of the colour of sea water, or of shining iron, and if a small degree of light can be perceived at the side, there is reason to hope well of the case. He forbids us to operate until the disease has attained a proper consistence. He directs us to place the patient opposite the operator, who is to sit on a higher seat, while the patient's head

- ¹ अथ साधारणे काले शुद्धसंभोजितात्मनः ।
 देशे प्रकाशे पूर्वोक्ते भिषग् जानुच्च पीठगः ॥
 यान्त्रितस्योपविष्टस्य स्त्रिद्राचस्य मुखानिलैः ।
 अङ्गुष्ठं यदिने नेत्रे दृष्टौ दृष्टोत्पन्नं सलम् ॥
 खनासां प्रेक्षमाणस्य निष्क्रम्यं मुर्ध्नि धारिति ।
 कृष्णादूर्ध्वान्गुलं मुक्ता तदूर्ध्वार्धमपाङ्गतः ॥
 तर्जनीमध्यमाङ्गुष्ठैः शलाकां नियन्त्रं धृताम् ।
 देवच्छिद्रं नयेत् पाश्चादूर्ध्वमामस्थयन्निव ॥
 सव्यं दक्षिणहस्तेन नेत्रं सव्येन चेतरेत् ।
 विध्येत् सुविष्टे शब्दः स्यादरुक् चाम्बुलवसुतिः ॥
 सान्त्वयन्नातुरं चानु नेत्रं सव्येन सेचयेत् ।
 शलाकायास्ततोऽप्येव निर्लिखेन्नेत्रमण्डलं ॥
 अवाधमानः शनकैर्नासां प्रतिनुदस्ततः ।
 चच्छिन्नाश्चापहरेद् दृष्टिमण्डलं कफम् ।
 स्थिरे दोषे चले चापि स्वेदयेदक्षिवाह्यतः ॥
 अथ दृष्टेषु रूपेषु शलाकामाहरेच्छनैः ।
 घृताद्भूतं पितुं दत्त्वा वज्राक्षं शाययेत्ततः ॥
 विद्धादन्त्येन पात्रेण तमुत्तानं हयोर्व्यधे ।
 निवाते शयनेऽभ्यक्तशिरः पादं हितरेतम् ॥

is held by an assistant. The sound eye is to be previously covered up with wool. If the left eye is affected, the operator must use his right hand, and *vice versa*. A needle which is sharp and not too slender is to be passed direct through the two coats at a place intermediate between the temporal angle and the black of the eye, and towards the middle of the cataract. When the needle has perforated far enough, which is readily known by the absence of resistance, it is to be turned so as gradually to remove the cataract below the region of the pupil and this object being attained it is to be strongly pressed to the lower part. If it remain there the operation is completed, but if it return, it is to be cut and torn by the needle into many pieces, in which state they are easier depressed, and prove less troublesome. The needle is then to be drawn out direct and soft wool smeared with white of an egg, and other anti-inflammatory applications are to be used. Quiet, restricted diet, and soothing treatment will be proper.¹ Paul², Mesue³, Albucasis⁴, Rhazes⁵ and others also describe the operation of couching in similar terms. Albucasis gives figures of these needles.

The operation is still practised in India by the māls who consider themselves specialists in diseases of the eyes.

21. SARPĀŚYA.

Vāgbhāṭa describes an instrument having its end resembling

¹ Celsus. vi. See Adam's Commentary to Paul VI. xxi.

² Paul. VI. xxi.

³ Mesue. De Aegr. oculi, 15.

⁴ Albucasis. Chirrug, ll. 23.

⁵ Rhazes. Ad mansor.

the mouth of a snake ¹. The blade is said to be half an *āṅguli* long. It is advised to be used for excision of the nasal and aural polypi.

The fact that it was able to work inside the nose and the auditory canal shows that it could not have been of any great breadth, possibly less than a quarter of an inch at the most. The exact shape of the *sarpāsya* can not be determined with certainty. The Greeks however used for the same purpose, "a polypus scalpel, having its extremity shaped like a myrtle leaf," which was a double instrument, the other end being a scoop ².

GOLD OR SILVER KNIFE.

To cut the navel cord, Caraka ³ recommends the use of a knife, made of gold, or silver, or iron. To make gold and silver knives of sharp edges seems absonous to our reason, but we must remember that to cut the navel cord, a very keen edge is not required, and even now the purpose is often served by the native *dhāis* with a piece of split bamboo.

¹ सर्पास्यं घ्राणकर्णाश्लेष्मिदनेऽङ्गुलं फले ॥

Aṣṭāṅga Hṛdaya Saṁhitā. I. xxvi.

सर्पास्यं नाम शस्त्रमाह । सर्पास्यं इत्यादि सर्पास्यं नाम शस्त्रं नासिका कर्णाश्लेष्मिदने योन्यं तच्च फले अङ्गुलार्धपरिमितं अङ्गुलपरिमितं फलकमित्यर्थः । अस्य सर्पसुखसदृशं सुखत्वात् सर्पास्यमिति संज्ञा ।

Vāgbhaṭārtha Kaumūdī. I. xxvi.

² Paul. VI. xxv.

³ See foot-note 4. P. 65.

PRATUDA.

Suśruta mentions it as a knife to be used for making scarifications on the body of a lunatic.¹

The mode of holding the sharp instruments.

Suśruta says²: “The vṛddhipatra is to be held at the junction of the handle and the blade; and all instruments used for incision should be held similarly. The vṛddhipatra and maṇḍalāgra, if used for scarification, should be held with the hand raised a little; when used for evacuating abscesses, they, as well as all other instruments, should be held by the fore part of the handle. But in the case of children, old or delicate or timid persons, women, and kings and princes, abscesses should be evacuated with the trikūrceaka. The vṛhimukha is to be held with the thumb and forefinger, its handle being covered within the palm. The kuṭhārikā is to be held in position with the left hand, and struck with the middle finger when let go forcibly from the under surface of the thumb of the right hand. The ārā, karapatra and eṣaṇī should be held at their extremities.

¹ प्रतुदैर्दारयेत्त्रेन मर्मघातं विवर्जयेत् ।

सर्पिधाने जरत्कूपे सततं वा निवासयेत् ॥

Suśruta Saṁhitā, VI. liii.

² तेषामनययोग यद्दृष्टं समालोपायः कर्मसु वक्ष्यते । तत्र वृद्धिपत्रं हन्तफलसाधारणे भागे गृह्णीयद्दिनान्येव सर्वथाणि । वृद्धिपत्रं मण्डलाग्रश्च किञ्चिदुत्तानपाणिना लेखने बहुशोऽवचार्यं हन्ताये विस्मार्थानि । विशेषेण बालवृद्धसुकुमार भीरु नारीणां रात्रां राजपुत्राणाञ्च विकृञ्चकेन विस्मावयेत् । तत्र प्रच्छादित हन्तमङ्गुष्ठं प्रदेशिनीभ्यां ब्रीहिसुखं । कुठारिकां वामहस्तन्यस्तानित-
रङ्गस्य मध्यमाङ्गुल्याङ्गुष्ठं विवृण्वयाभिपृन्यात् । आराकरपपवैषण्यो मूलौ । शेषाणि तु यथायोगं गृह्णीयात् ।

Suśruta Saṁhitā, I. viii.

The other instruments are to be held as required in particular cases." Vāgbhata also gives similar directions ¹.

The practical training in surgical operations.

Suśruta says ² : "Even after a pupil has mastered the whole of the medical treatises, the preceptor should instruct him practically how to perform surgical operations and how to administer oils and other medicines. However learned he may be in books, he cannot be fit for surgical practice, unless he has acquired the practical training. Therefore the preceptor should show his pupils the methods of operations, of incision, excision and division, upwards and downwards on the pumpkin, bottle-gourds, water-melons, and the three varieties of cucumbers—*Trapaṣa* (*Cucumis Sativus*), *Ervārūka* (*Cucumis Utilissimus*), and *Karkarūka* (*Cucumis Melo*).

¹ क्वेद भेदेन लिख्यार्थं शस्त्रं हन्त फलान्तरे ।
तर्जनी मध्याङ्गुलं लीयात् सुसमाहितः ।
विस्त्रावणादि हन्तायै तर्जन्यङ्गुलके न च ।
तल प्रकृन्न हन्तायै यास्य ब्रीहिसुखं सुखे ।
मूलेष्वाहरणार्थानि क्रिया सौकर्यतोऽपरं ॥

Aṣṭāṅga Hṛdaya Saṁhitā. I. xxvi.

² अधिगत सर्वशास्त्रार्थमपि शिष्यं योग्याङ्कारयेत् । क्वेदादिषु क्षेत्रादिषु च कर्मपथमुपदिशेत् । सुबहुश्रुतोप्यकृत योग्यः कर्मस्वयोग्यो भवति । तव पुष्पफलालाबू कालिन्दक-तपुष्वैवैराकककार्काक प्रभृतिषु क्वेद विशेषान् दर्शयेदुत्कर्तनपरिकर्तनानि चोपदिशेत् । इति वस्त्रि प्रसेवक प्रभृतिपदकपङ्क पूर्णेषु भेद योग्याः । सरोक्षि चर्मोपस्थातते लिख्यस्य । सत पशुसिरासूतपलनालिषु च वेध्यस्य । घुणोपहत काष्ठवेणु नलनालीयुष्कालावुसुखेष्वप्यस्य । पनशविम्बीविलफलमज्जसतपशुदन्तेष्वाहार्यस्य । मधूच्छिष्टोपलिप्ते शाल्यलीफलके विस्त्राव्यस्य । सूक्ष्मघनवस्त्रान्तयोर्मृदुचर्मोन्तयोश्च सीव्यस्य । पुस्तमय पुरुषाङ्गप्रत्यङ्ग विशेषेषु वन्धयोग्याः । मृदुमांसपेशीषूतपलनालिषु च कर्णसन्धिवन्धयोग्याः । मृदुषु मांसखण्डेष्वग्निप्रसारयोग्याः । उदक पूर्णघटपार्श्व स्रोतस्खलावसुखादिषु च नेत्रप्रणिधानवस्त्रिघ्न वस्त्रि पीडन योग्यामिति ।

Suśruta Saṁhitā. I. ix.

The operation of puncturing or tapping may be demonstrated on leather bags, bladders and pouches, filled with slush; scarifications, on stretched pieces of leather covered with hair; opening on the veins of dead animals or on stalks of water-lily; probing on worm-eaten wood, bamboo, reed, tube or dried bottle-gourd; extraction, on the pulp of jack fruit, the Bael fruit (*Ægle Marmelos*), Vimbī fruit (*Cephalandra Indica*) or on the teeth of dead animals. Evacuation on a lump of wax applied to a board of Śālmali wood (*Bombax Malabaricum*); sewing, on the two ends of a thick piece of cloth or soft leather; bandaging on the limbs of a dummy (human figure made of cloth and clay), bandaging the root of the ear, on a piece of soft flesh, or the stalk of a water-lily; application of cauteries, on pieces of flesh; introduction of tubes for clysters (urethral, rectal and vaginal) and wound-syringe, on the spout of an earthen vessel filled with water, or on the mouth of a bottle-gourd or similar objects."

CHAPTER VII.

THE ANUŚASTRA.

The anuśastra means substitutes for cutting instruments. They are the following¹ :—

1. Bamboo. 2. crystal. 3. glass. 4. ruby. 5. leeches. 6. fire. 7. caustics. 8. the nails. 9. leaves of Goji (Elephantobus Scaber), 10. Śephālikā (Nyctanthe Arbortristis), and 11. Śākhā (Tectona Grandis). 12. young stems of plants. 13. hair. 14. finger.

These are advised to be used in case of infants or timid persons or when the proper instruments are not available.²

1. BAMBOO.

A piece of split bamboo is said to have been used for cutting through and cutting into some parts of the body. It is still used by the native dhāis or midwives for cutting the funis.

A piece of bamboo is directed to be used for applying pressure on small boils to cure them by subsidence³. For the same purpose, the pressure of the thumb is also recommended⁴.

¹ अनुशस्त्राणि तु त्वकसारस्फटिककाचकुरुत्रिन्दजलीकाग्निसारनखगोजीशेफालिका-
शकपत्र करीरवालाङ्गुल्य इति ।

Suśruta Samhitā, I. viii.

² शैतानां शस्त्रभीरुणां शस्त्राभावे च योजयेत् ।
त्वकसारादि चतुर्वर्गं हृदये भेदे च बुद्धिमान् ॥

Ibid.

³ हतं दोषेषु यथानुपूर्व्यं गन्धौ भिषक् श्रेष्ठः समुत्थिति तु ॥
स्विन्नस्य विस्त्रापनमेव कुर्यादङ्गुललोहोपलवेण द्रष्टुं ।

Ibid. IV. xviii.

⁴ अथन्यः स्वेदयित्वा च वेणुनाद्या ततः शनैः ।
विस्त्रापनार्थं मृद्वीयात् तलेनाङ्गुलकेन वा ॥

Cakradatta, Vraṇaśoṭhā Cikitsā.

Bamboo is also mentioned to have supplied largely the materials of splints for treatment of fractures and dislocations. For this purpose it is to be split into thin layers¹. Split bamboo is still used for the treatment of fractures by the *kavirājes* and might advantageously be used by the modern surgeons as a cheap and easily available material for splint.

Dissection.

It is generally supposed that the practice of dissection of the human body for anatomical studies was unknown to the ancients. But the practice of human dissection is unmistakably referred to in the *Suśruta Saṁhitā*.² Brushes made of bamboo, barks of trees, grass roots, and hairs are mentioned as instruments of dissection. "Thus a body should be secured which is complete in all the parts and which is of a person who was not more than 100 years old, nor who died from the effects of poison or of a chronic disease. Having cleared the intestines of any faecal matter, the body should be well wrapped either in *Muñja* (*Saccharam Munja*), or grass, or barks of trees or hemp etc., put inside a cage which should be firmly fastened, in a solitary spot, in a calm river and thus allowed to decompose. After seven nights, having taken out

¹ विभ्रयच्च नरं दृष्ट्वा वेणुखण्डेन बन्धयेत् ।

सृचयेन्नवनीतनैरेणुपत्रय वेष्टयेत् ॥

Hārta Saṁhitā, II.I lvī.

² 'तस्मात्समस्तगात्रमविषोपहतमदीर्घव्याधिपीडितमवर्षशतक' निःसृष्टान्तपुरीषं पुरुषम-
बहन्त्याम्रपगायां निवद्धं पञ्चरस्यं सुस्रवल्कलकुशशशादीनामन्यतमेनावेष्टिताङ्गमप्रकाशे देशे
कोथयेत् सम्यक् प्रकुथितचोदृत्य ततो देहं समरात्रादुशीरं बालवेणु वल्कलं कूचीनामन्यतमेन
शनैः शनैरववर्षय' स्वगादीन् सर्वानिव वाह्याभ्यन्तराङ्गप्रत्यङ् विशिषान् यथोक्तान् लक्षयेच्चक्षुषा ।

Suśruta Saṁhitā, III. २,

the thoroughly decomposed body, it should be slowly rubbed with a brush made either of Uṣīra (*Andropogon Muricatus*) or hair, or bamboo, or barks of trees, examining at the same time with the eyes, every division and sub-division of the body, external or internal, beginning with the skin, as delineated in the śāstras." Animal anatomy was also thoroughly understood as each part of the body had its own distinctive name.

Hoernle¹ says : "Probably it will come as a surprise to many as it did to myself, to discover the amount of anatomical knowledge which is disclosed in the works of the earliest medical writers of India. Its extent and accuracy are surprising, when we allow for their early age—probably the sixth century before Christ—and their peculiar methods of definition.***Of the practice of such dissection in ancient India we have direct proof in the medical compendium of Suśruta, and it is indirectly confirmed by the statements of Caraka. It is worthy of note, however, that in the writings of neither of these two oldest Indian medical writers is there any indication of the practice of animal dissection."

The Greeks did not practise dissection of the human body. "The anatomical knowledge of the Hippocratists was derive chiefly from dismemberment of animals, experience in slaughtering and sacrifices, and from the observation of surgical cases. Systematic dissection of the human body was out of the question owing to the religious precepts which strictly enjoined immediate burial, and to the superstitious horror of the dead which then prevailed. The supposition that outstanding individual investigators, upon rare occasions, did not hesitate to examine

¹ Hoernle. Osteology. Preface. iii-

human bodies or parts of bodies (particularly) bones, in order to correct prevailing opinions, is one which, if not susceptible of direct proof, is at least probable. This supposition, besides being borne out by many statements on the part of ancient writers, is the more probable since the bodies of savages, traitors and criminals were outside the pale of religious ordinances and were therefore available, as were also accidentally obtained portions of the body, to satisfy the curiosity of scientific investigators. No one of the oft-quoted extracts from the Hippocratic writings, supposed by individual historians to refer to human dissection, is quite conclusive, whilst nowhere is there in the pathology of the day any definite trace of anatomical research upon the bodies of those dead of disease. On the other hand comparisons are frequently instituted by the Hippocratists referring to facts acquired through zootomy or to anatomico-pathological discoveries such as might have been made in the slaughtering of beasts.”¹

The study of anatomy received its impetus from the Alexandrian School. “Herophilus improved the technique and developed the terminology of anatomy and enriched it by valuable discoveries made in the dessection of human bodies, particularly in the knowledge of nerves, vessels and viscera, but also in that of the eye. With his works, systematic anatomical investigation may in fact be said to begin.”²

“Like Herophilus, Erasistratos made a successful study of anatomy, even surpassing the former in knowledge of details, and in a series of observations upon the cadavers of men and

¹ History of Medicine. Neuberger. P. 150.

² Ibid. P. 177-8.

animals, corrected his own mistakes as well as those of others. His greatest achievement was in the study of nerves and vessels.”¹

2, 3 AND 4. CRYSTAL, GLASS AND RUBY.

These are recommended to be used for cutting through and cutting into some parts of the body.

Glass vessels for preparing medicines are often mentioned, Śārṅgadharā² used it for purifying mercury.

5. LEECHES.

Leeches are described to be the mildest of all means for extracting blood, and are recommended for princes, children, women, and timid people³.

Twelve kinds of leeches are described⁴; six of them are poisonous and six, non-poisonous.

¹ History of Medicine. Neuburger. P. 181.

² काचकृष्णं विनिलिप्य ताच्च स्रवस्त्रमुद्रया ।

विलिप्य परितो वक्त्रं मूत्रं दत्त्वा च शौषयेत् ॥

Śārṅgadharā Saṁgraha, II. xii.

³ नृपाञ्जलस्थविरभीरुदुर्बलनारी सुकुभाराणामनुयहार्यं परमसुकुमारोऽयं शोणितावसे च नोपायोऽभिहितो जलौकसः ॥

Suśruta Saṁhitā, I. xiii.

⁴ जलमासामायुरिति जलौकः का जनमासामौक इति जलौकसः । ता द्वादश तासां सविषाः षट् तावत्येव निर्विषाः । तत्र सविषाः कृष्णा कर्बुरा अलगाद्वा इन्द्रायुधा सासुद्रिका गोचन्दना चेति । ताम्रज्जनचूर्णवर्णा पृथुशिराः कृष्णा । वस्त्रिमत्स्ववदायता क्षिप्रोन्नतकुक्षिः कर्बुरा । रोमशा महापाश्वी कृष्णमुख्यलगद्वा । इन्द्रायुधवदूर्ध्वाराजिभिष्वित्वा इन्द्रायुधा । ईषदसितपीतिका विचित्रपुष्पाकृतिचित्रा सासुद्रिका । गोवधवदधोभागी विषाभूतकृतिरणमुखी गोचन्दनेति । ताभिर्दृष्टे पुरुषे दंशे श्वयथुरतिमात्रं कष्टमुच्छी

The poisonous leeches are :—

1. Kṛṣṇā:—it is of the colour of black collyrium and has a broad head.

ज्वरोदाहृच्छिर्मंदः सदनमितिलिङ्गानि भवन्ति । तत्र महागदः पानालीपननस्य कर्मादियूप-
योज्यः । इन्द्रायुधादष्टमसाध्यमित्येताः सविषाः सचिकित्सिता व्याख्याताः । अथ निर्विषाः ।
कपिला पिङ्गला शङ्कुमुखी मूषिका पुण्डरीकमुखी सावरिकार्चिता । तत्र मनःशिलारजिता-
भ्यामिव पार्श्वीभ्यां पृष्ठे स्निग्धमुद्गवर्णा कपिला । किञ्चिद्रक्ता हत्तकाया पिङ्गाशुगाच पिङ्गला ।
यत्नवर्णा शीघ्रपायिनी दीर्घतीक्ष्णमुखी शङ्कुमुखी । मूषिकाकृति वर्णाऽनिष्टगन्धा च मूषिका ।
मुद्गवर्णा पुण्डरीकतुल्यवक्त्रा पुण्डरीकमुखी । श्लिग्धा पद्मपत्रवर्णाष्टादशाङ्गुलप्रमाणा सावरिका
साच पञ्चर्थः । इत्येता अविषा व्याख्याताः ।

तासां प्रग्रहणमार्द्रचर्मणान्यैर्वा प्रयोगैर्गृहीयात् । अधेनां नवे महति घटे सरस्तङ्गा-
गोदकपङ्कमावाप्य निदध्यात् । भक्ष्यार्थं चासामूपहरेच्छैवलं बल्लूरमौदकांश्च कल्दां-
श्चूर्णीकृत्य शय्यार्थं तण्मौदकानि च पत्राणि । ब्राह्मन्नाह्वाचान्यज्जलं भक्ष्यञ्च दद्यात् ।
सप्तरात्रात् सप्तरात्राच्च घटमन्यं संक्रामयेत् । भवति चात्र ।

स्थूलमध्याः परिक्रिष्टाः पृथ्वी मन्दविचष्टिताः ।

अग्राङ्घ्रिष्योऽल्पपाथिन्यः सविषाश्च न पूजिताः ॥

अथ जलीकोऽवसीकसाध्यव्याधितमुपवेश्य संवेश्य वा विरुज्य चास्य तमवकाशं गृह्येय-
चूर्णैर्यद्यरुजः स्यात् । गृहीताय ताः सर्पपरजनौकल्कोदकं प्रदिग्धगावोः सलिलसरकमध्ये
मुहूर्त्तस्थिताविगतकृमा ज्ञात्वा तामीरोगं ग्राहयेत् । सूक्ष्मशुक्रार्द्रपिचुप्लीतावच्छन्नां कृत्वा
मुखमपाङ्गणयादगृह्णन्त्यै चीरविन्दुं शोणितविन्दून् वा दद्याच्छस्त्रपदानि वा कुर्वीत यद्येवमपि न
गृह्णीयात्तदानीं ग्राहयेत् । यदा च निविशतेऽश्वमुरवदाननं कृत्वोन्नय्य च स्नानं तदा
जानीयाद् गृह्णीतीति गृह्णन्तीं चार्द्रवस्त्रावच्छन्नां धारयेत् सेचयेच्च । दंशं तोदकन्दूप्रादुर्भा-
वैर्जानीयाच्छुद्धिमयसादत्त इति शुद्धसाददानामपनयेत् । अथ शोणितगन्धेन न मुचेन्मुखमस्याः
सैन्धवचूर्णेनावकिरेत् । अथ पतितां तण्डुलकण्डनप्रदिग्धगावीं तैललवणाभ्यक्तमुखीं वाम-
हस्ताङ्गुष्ठाङ्गुलीभ्यां गृहीतपुच्छां दक्षिणहस्ताङ्गुष्ठाङ्गुलीभ्यां शनैः शनैरनुलोममनुमार्जयेदा-
मुखाङ्गामयेत्तावद्यावत्सम्यग्वान्तलिङ्गानीति । सम्यग्वान्ता सलिलसरकमस्ता भोक्तुकामा सती
चरेत् । *या सौदति न चेष्टते सा दुर्ब्बान्ता तां पुनः सम्यग्वामयेत् । दुर्ब्बान्ताया व्याधिर-
साध्यइन्द्रमदो नाम भवति । अथ सुवन्तां पूर्ववत् सन्निदध्यात् शोणितस्य च योगायोगानवेच्य
जलीकोव्रणान्मधुनावघट्टयेच्छीताभिरङ्घ्रिष्य परिषेचयेवप्लीतं वा व्रणं काषाय मधुर स्निग्धशीतैश्च
प्रदेहैः प्रदिष्टादिति ।

2. *Karvūrā*:—it is as long as an eel with elevated stripes across the abdomen.

3. *Alagarddā*:—it looks as if covered with hair and has large sides and black mouths.

4. *Indrāyudhā*:—or rain-bow coloured; it has rain-bow coloured longitudinal stripes on the back.

5. *Sāmudrikā*:—it is of dark yellow colour and has variegated flower like spots on its body.

6. *Gocandanā*:—it has a bifurcated tail like the scrotum of a bull and a small mouth.

The non-poisonous ones are—

1. *Kapilā* or the greenish one;—it has its two sides of the colour of orpiment, and on its back, it is smooth and of the colour of a green pea.

2. *Piṅgalā* or twany;—it is of a reddish-brown colour, has a round body and moves quickly.

3. *Śaṅku-mukhī* or bluish-red;—it is of the colour of the liver, sucks quickly and has a long sharp mouth.

4. *Mūṣikā* or rat-like;—it has the shape and colour of a rat's tail and emits a disagreeable smell.

5. *Pundarika-mukhi* or lotus-faced;—it is of the colour of a green pea and has a mouth like a lotus.

6. *Savarikā*;—it is slimy, coloured green like a lotus-leaf and eight angulil long; it is to be used in veterinary practice.

The non-poisonous leeches generally live in meadows and fresh water. They are to be caught with a piece of wet leather and

kept in a new large earthen pot filled with mud, water, green fungi, dry flesh, etc. The water is to be changed every third day and the pot every seventh day.

To apply leeches, the patient is directed to lie down and the part is to be rubbed dry with powdered cow dung and earth. The leech is then to be smeared with a paste containing turmeric, mustard and water, to excite them, washed thoroughly with water and then applied, its body being covered with a piece of wet cloth. To fix it quickly, a drop of milk or blood is to be applied over the diseased part, scarification of which is also recommended instead. When the leech has removed the necessary quantity of blood, a small quantity of salt is advised to be sprinkled upon its head to make it drop off. Then the leech is to be put upon some powdered rice and its mouth is advised to be smeared with oil and salt.

Then it is to be stripped and put in fresh water, and should be used again, if it moved, but if languid, thrown away.

The leech-bites are to be smeared with honey, cold water and astringent substances, or poulticed.

Vāgbhata also gives similar directions for the application of leeches.¹

¹ जलौकमन्तु मुखिनां रक्तसावाय योजयेत् ।

दृष्टास्त्वसत्स्य भेकाहि श्वक्त्रोथमलोद्भवाः ।

• • रक्ताः श्वेता भृशं कृष्णायपन्ताः मृत्युपिक्विलाः ॥

• इन्द्रायुधविचित्रोद्भूराजयो रोमशाय ताः ।

सविषा वर्जयेत्ताभिः कण्डुपाक ज्वरभसाः ॥

विषपित्तास्त्रन्तु कार्यं तव गङ्गास्त्रजाः पुनः ।

निर्विषाः श्रेयलश्यावा हृत्ता नीलशूराजयः ॥

Dr. Ray has clearly shown that "the discription of leeches as given by Rhazes agrees almost word for word with that of Suśruta (Samasrad) in many places". He describes the parallelism at length and comes to the conclusion "of the use of a chapter of the Susruta or some such work¹".

6 AND 7. FIRE AND CAUSTICS.

The use of cauteries in surgery has been described before under the head of the accessory blunt instruments².

कषायं पृष्ठास्तन्वज्जः किञ्चित् पीतदराय याः ॥
 ता अप्यसम्यग् वमनात् प्रततञ्च निपातनात् ।
 मीदन्तीः सलिलं प्राप्य रक्तसत्ता इति व्यजेत् ॥
 अथतरा निशाकल्कं युतेऽश्वसि परिप्लुताः ।
 अवन्तिमोमे तर्ज्वा पुनश्चाश्रयिता जले ॥
 नाशयेद् घृतसृत्स्नाङ्गं शस्त्रं रक्त निपातनैः ।
 पिवन्तीरुद्रहृतं स्नात्वाग्नादयेन्मृदुवाससा ॥
 संप्रक्ताङ्गुष्ठं गुदास्त्राज्जलीका दृष्टशोणितम् ।
 आदत्ते प्रथमं हंसः क्षीरं क्षीरोदकादिव ॥
 दंशस्य तोदं कण्डूनां वा मोचयेद्दामयेच्च ताम् ।
 पटुतैलाक्तवदनां श्लेष्म कण्डूनां रुचिताम् ॥
 रक्तं रक्तमटाद् भुयः सप्ताहं वा न पातयेत् ।
 पूर्ववत् पटुता दास्यं सम्यग् वान्ते जलीकसाम् ।
 क्लमोतिशोभाश्चतुर्वा दृष्ट्वांते सत्वता मदः ॥
 अथवान्यत्र ताः स्थाप्या घटे सृत्स्नाम्बुगर्भिनि ।
 नालादिकोथ नाशार्थं सविषाः सुस्नदन्वयात् ॥
 अगद्गी सावयेदंशान् हरिद्रा गुडमाचिकैः ।
 शतधीतान्यपिचवस्ततो लिपाथ शीतलाः ॥

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxvi.

¹ History of Hindu Chemistry, Introduction P. lxviii.

² See Page 213-9.

8 AND 11. FINGERS AND NAILS.

The uses of surgeon's fingers and nails in surgical operations has been described before¹.

9,10 AND 11. LEAVES.

Rough leaves such as those of Fig trees (*Ficus Indicus*, *Goji* (*Elephantopus Scaber*), *Śephālikā* (*Nyctanthes Arbor-tristis*) and *Śaka* (*Tectonia Grandis*) are recommended for scarifying abscesses if they do not heal up after repeated opening by the knife. If there is any formation of pus in the mouth or eyelids, it may be evacuated with these leaves (*Susruta*)². These leaves are also to be used for bleeding the gums in gingivitis.

To cover the wounds, *Suśruta* gives a list of leaves to be used according to the nature of the wound and season of the year³ :—

For air-deranged wounds;—use leaves of *Brājada* (*Vicinus Communis*), *Bhūrjapatra* (*Betula Bhojpatra*), *Pūtika* (*Caesalpinia Bonducella*) and *Haridrā* (*Curcuma Longa*).

¹ See Page 199-202, and 204-5.

² संशोध्योभयतः कार्यं शिरयोप कुशं तथा ।
काकोडुम्बरिका गोजीपत्रेर्विस्त्रावयदष्टक् ॥

Suśrutā Samhitā, IV. xii.

³ परण्डु भूर्जपृतीक हरिद्राणान् वातजं ।
पत्रमाश्रयन् यच्च काश्मरी पत्रमिव च ॥
पत्राणि क्षीरब्रूक्षणास्मौदकानि तथैव च ।
दूषितं रक्तपित्ताभ्यां ब्रणे दद्याद्विचक्षणः ॥
पाठामूर्च्छागुडूचीनां काकमाचीहरिद्रयोः ।
पत्रञ्च युक्तनाशया योजयेत् कफजं ब्रणे ॥

For bile or blood-deranged wounds ;—use leaves of *Āśvabala* (*Basella Rubra*), *Kāśmaripatra*, (*Gmelina Arborea*), *Vata* (*Ficus Bengalensis*) and *Kumuda* (*Nymphae Lotus*).

For phlegm-deranged wounds—use leaves of *Pāṭhā* (*Cisampelos Hexandra*), *Mūrvā* (*Sansevieria Zeylanica*), *Guḍuḥī* (*Tinospora Cordifolia*), *Kākamācī* (*Solanum Nigrum*), *Haridrā* (*Cureuma Longa*) and *Śuknāśā* (*Oroxylum Indicum*).

For similar purpose *Caraka*¹ recommends us to use the leaves of *Kadamva* (*Anthocephalus Cadamba*), *Arjuna* (*Terminalia Arjuna*), *Nimva* (*Azadirachta Indica*), *Pātālī*, *Pippala* (*Ficus Religiosa*) and *Arka* (*Calotropis Gigantea*).

The leaves of the *padma* or *nymphae* are to be used for handling the eyeballs and the intestines, to replace them in their proper position when prolapsed by injury² (*Suśruta*) *Caraka* recommends lotus leaves and plantain leaves as coverings to the bleeding piles,³ *Cakradatta*⁴ mentions the use of

¹ कदम्बार्जुननिम्बानां पाटल्याः पिप्पलस्य च ।

व्रण प्राच्छादने विद्वान् पत्राण्यकंस चादिशेत् ॥

Caraka Saṁhitā, VI. xiii.

² भिन्नं नेवसः स्मृण्यमभिन्नं लम्बते तु यत् ।

तन्निवेश्य यथास्थानमस्याविद्वशिरं शनेः ।

पीडयेत् पाणिना सम्यक् पद्मपत्रान्तरेण तु ॥

Suśruta Saṁhitā, IV. ii.

³ कदलीदलरभिनवेः पुष्कर पत्रेभ्यः शीतजलसिक्तैः ।

पच्छादनं सुकुम्भुङ्गरिः पद्मोत्पलदलेभ्यः ॥

Caraka Saṁhitā, VI. ix.

⁴ गोजीशेफालिका पत्रैरशः संलिख्य लेपयेत् ।

क्षारेण वाक्शतं तिष्ठेद् यन्महारं पिपाय च ॥

Cakradatta, Arśa Cikitsā.

Gojī and Śephālikā leaves for scratching the piles before the application of caustics to them. He also directs us to rub the small tumours with the rough leaves before the application of various ointments.¹ Śivodāsa also mentions the use of such leaves for rubbing the eyelids in the pillva disease.² Suśruta³ mentions the use of rough leaves for scratching any part.

Paul⁴ mentions the use of fig leaves, for rubbing down the hard granulations of granular lids.

12. YOUNG STEMS OF PLANTS.

The young shoots are described to have served the purpose of a probe. Caraka⁵ calls them the soft variety, the metallic ones being called the hard probes. These shoots are to be used for superficial sinuses. Suśruta directs us to use the young shoots

- ¹ विष्टुष्य चोडुस्वरशकगोजी-
पवेर्भृश' चौद्रयुतेः प्रलिम्बेत् ।

Cakradatta, Granthiyarvuda Cikitsa.

- ² वर्त्नावलिख' बहुशस्तदच्छेषितमोचणम् ।
पुनः पुनर्विरिकञ्च पित्त्रोगातुरा भजेत् ॥

Cakradatta, Netraroga Cikitsā.

वर्त्नावलिखमिति । कर्कशशाखोटकादि पवेण वर्त्मघर्षणम् ।

Tattva Candrikā. Ibid.

- ³ चौमं श्लोतं पितुं फेनं यावयुक्तं ससैन्धवं ।
कर्कशानि च पवाणि लिखनार्थं प्रदापयेत् ॥

Suśruta Saṁhitā. IV. i.

⁴ Paul, III. xxii.

⁵ See foot-note 4. P. 269.

of the pot-herbs called Cuñca and Upālikā (*Basella Rubra*) as probes in sinuses on the eyelids and around the anus.¹

If in young people the teeth become loose as the result of some injury, the patient should be directed to live upon milk only, sucking it through the stalk of lily; and thus affording the teeth rest and a chance of being firmly fixed again.²

To excite emesis, Śārṅgadharma,³ advises us to introduce a tube of Branda (*Ricinus Communis*) into the throat of the patient. The vomiting is also said to have been excited by thrusting a finger or a stalk of lily down the throat.

- ¹ नाडी व्रणान् शल्यगर्भानुन्मार्ग्युत्सङ्गिनः शनैः ।
करिरवानाङ्गुलिभिरिषग्या वैषयेद्विषक् ॥
नेत्रवर्त्मगुदाभ्यासनाद्योऽवक्ताः शशोष्णिताः ।
तुच्चपोदकजेः श्लेष्मैः करीरैरिषयेत्तु ताः ॥

Suśruta Saṁhitā, IV. i.

- ² अभग्रांश्चक्षितान्दलान् सरक्तावपीडयेत् ।
तरुणस्य मनुष्यस्य शीतैरालपयेद्वहिः ॥
सिक्ताम्बुभिस्ततः शितैः सन्धानीयैरुपाचरेत् ।
उत्पलस्य च नालिन चीरपानं विधीयते ॥

Suśruta Saṁhitā, IV. iii.

- ³ अजीर्णं कोष्णपानीयं सिन्धु पीत्वा वसेत् सुधोः ।
वसनं पाययित्वा च ज्ञानुमात्रासने स्थितम् ॥
ऋषिरक्तनालिनं स्पृशन् वामयेद्विषक् ।
ललाटं वमतः पुंसः पार्श्वो द्वौ च प्रबोधयेत् ॥

Śārṅgadharma Saṁgrahaḥ, III. iii,

CHAPTER VIII.

HYGIENIC APPLIANCES AND HOSPITAL REQUISITIES.

TOOTH-BRUSH.

The ancient Hindus used branches of trees as tooth-brush. They should have the length of twelve *āṅguli* and the circumference equal to that of the little finger. *Suśruta* directs us to use a straight and plain branch of such trees as have an astringent, or sweet, or bitter, or sour taste¹. Amongst these classes of trees, the twigs of *Khadira* (*Acacia Catechu*), *Madhuka* (*Brassia Latifolia*), *Nimba* (*Melia Azadirachta*), *Karñja* (*Pongamia Glabra*) are the best. The end of the stick is to be chewed first to form a brush and the teeth are then to be rubbed with it. He recommends us to use some tooth-powder.²

- ¹ तत्रादौ दन्तपवन द्वादशाङ्गुल मायतं ।
कनिष्ठिका परिणाह सृजयथितमन्नं ॥
अयुग्मयन्ति यच्चापि प्रत्ययं शस्तभूमिजं ।
अवेत्यर्त्तं च दोषश्च रसं वीर्यं च योजयेत् ॥
कषायं मधुरं तिक्तं कटुकं प्रातरुत्थितं ।
निम्बश्च तिक्तको श्रेष्ठः कषाये खदिरस्तथा ।
मधुको मधुरे श्रेष्ठः करञ्जः कटुके तथा ॥

Suśruta Samhitā, IV. xxiv

- ² चौद्र व्योष त्रिवर्गात् सतैलं सैम्बेन च ।
चूर्णं तेजोवत्याय दन्तान्नित्यं विशोधयेत् ॥
एकैकं वर्षयेद्दन्तं सटुना कूर्चकेन च ।
दन्तशोधनं चूर्णेन दन्तमांसन्यवाधयन् ॥

Ibid.

Bhāvamiśra mentions the names of other trees which may be used for the purpose,¹ and also gives us a list of trees to be avoided.² The use of the tooth-brush is contra-indicated in the various diseases of the mouth, ears, &c.³ Caraka⁴ advises us to use the tooth-brush twice a day.

- १ अक्षं वीर्यं वटं दीप्तिः करञ्जो विजयो भवेत् ॥
 प्रज्ञे चैवार्थसम्पत्तिर्वदर्यां मधुरोध्वनिः ।
 खदिरे मुखसौगन्ध्यं विल्वं तु विपुलं धनम् ॥
 उदुम्बरे तु वाक्मिद्विरात्रेत्कारोग्यमेव च ।
 कदम्बे तु धृतिर्मेधा चम्पके च हृदामतिः ॥
 शिरीषे कीर्त्तिर्भीमाग्न्य मायुरारोग्यमेव च ।
 अपामार्गं धृतिर्मेधा प्रज्ञाशक्तिसुधाध्वनिः ॥
 दाडिम्यां सुन्दराकारः कुकुम्भं कुटजे तथा ।
 जातीतगरमन्दारैर्दंस्त्रप्रञ्च विनश्यति ॥

Bhāva Prakāśa, I. i.

- २ गृवाकस्तालहिन्ताली केतकञ्च बृहत्तृण ।
 खर्जूरं नारिकेरञ्च सैन्धवे तृणराजकाः ॥
 तृणराजं समुत्पन्नं यः कुर्याद् दन्तधावनम् ।
 नरयाण्डालं धोनिः स्यादद्यावद्गङ्गां पश्यति ॥

Ibid.

- ३ नखादेद्गलताल्लोष्टं जिह्वारोगं समुद्भवे ॥
 अथास्यपाके आसिच कासहिक्का वमीष च ।
 दुर्ध्वलो जीर्णं भक्त्य मूर्च्छार्त्तामदपीडितः ॥
 शिरोरुगार्त्तसृषितः श्रान्तः पानक्रमाविवृतः ।
 अर्द्धितं कर्णशलीच दन्तरोगोच मानवः ॥

Saśrta Saṁhitā, IV. xxiv

- ४ आपोयितायं द्वौ कालौ कषायं कटुतिक्तकम् ।
 भक्षयेद्दन्तपवनं दन्तमांसान्यवाधयन् ॥
 निहन्ति गन्धवेरस्यं जिह्वादन्तास्यजं मलम् ।
 निष्कृष्य रुचिमाधत्ते सद्यो दन्तविशोधनम् ॥

Caraka Saṁhitā, I. ७.

Suśruta mentions the use of a tooth-brush to extract a fish-bone from the throat.¹

After cleansing the mouth with water after meals, I'Tsing ordains² "Chew tooth-wood in the mouth; let the tongue as well as the teeth be carefully cleaned and purified." Again he says: "It is surely not seemly for any one to spend his time after meals chaffing and chattering, nor is it right to remain impure and guilty all day and night, without preparing water in a clean jar or without chewing a tooth-wood."

He continues³: "Every morning one must chew tooth-woods, and clean the teeth with them, and rub off the dirt of the tongue as carefully as possible. Only after the hands have been washed and the mouth cleansed is a man fit to make a salutation; if not, both the saluter and the saluted are at fault. Tooth-wood is Danta-kāṣṭha in Sanskrit—danta, tooth, and kāṣṭha, a piece of wood. It is made about twelve finger-breadths in length, and even the shortest is not less than eight finger-breadths long. Its size is like the little finger. Chew softly one of its ends, and clean the teeth with it. If one unavoidably come near a superior, while chewing the woods, one should cover the mouth with the left hand.

Then breaking the wood, and bending it, rub the tongue. In addition to the tooth-wood, some tooth-picks made of iron or copper may be used or a small stick of bamboo or wood, flat as the surface of the little finger and sharpened on one

¹ सटुना वा दन्तधावनकृत्तकेनापहरित् ।

Suśruta Saṁhitā, I. xxvii.

² I'Tsing. Records of the Buddhist Religion. Takakusu. P. 26-7.

³ Ibid. ch. viii. Use of Tooth-woods. P. 33.

end, may be used for cleaning the teeth and tongue ; one must be careful not to hurt the mouth. When used, the wood must be washed and thrown away.

Whenever a tooth-wood is destroyed, or water, or saliva is spit out, it should be done after having made three fillips with the fingers or after having coughed more than twice ; if not, one is faulty in throwing it away. A stick taken out of a large piece of wood, or from a small stem of a tree or a branch of an elm, or a creeper, if in the forest ; if in a field, of the paper mulberry, a peach, a sophora japonica (Huai), willow tree, or anything at disposal, must be prepared sufficiently beforehand. The freshly cut sticks (lit. wet ones) must be offered to others, while the dry ones are retained for one's own use.

The younger priest can chew as he likes, but the elders must have the stick hammered at one end *and made soft* ; the best is one which is bitter, astringent or pungent in taste, or one which becomes like cotton when chewed. The rough root of the Northern Burr-weed (Hu Tai) is the most excellent ; this is otherwise called Tsâng-urh or Tsae-urh, and strikes the root about two inches in the ground. It hardens the teeth, scents the mouth, helps to digest food, or relieves heart-burning. If this kind of tooth-cleaner be used, the smell of the mouth will go off after a fortnight. A disease in the canine teeth or toothache will be cured after a month. Be careful to chew fully and polish the teeth cleanly, and to let all the mouth-water come out ; and then to rinse abundantly with water. That is the way. Take in the water from the nose once. This is the means of securing a long life adopted by Bodhisattva *Nágárguna*. If this be too hard to put in practice, to drink water is

also good. When a man gets used to these practices he is less attacked by sickness. The dirt at the roots of the teeth hardened by time must all be cleaned away. Washed with warm water, the teeth will be freed from the dirt for the whole of life. Tooth-ache is very rare in India owing to their chewing the tooth-wood."

TOOTH-PICK.

Suśruta advises us to use sticks of grass as tooth-pick after meals to extract particles of food lodged between the teeth, otherwise these will decompose and the mouth would be smelling badly.¹ Bhāvamiśra gives similar directions but adds that if any particles of food cannot be easily extracted by the tooth-pick, one must not use any force to extract them.² "After eating they cleanse their teeth with a wilow stick, and wash their hands and mouth."³

JIHVĀ NIRLEKHANA OR TONGUE SCRAPER.

Suśruta says: "To scrape the tongue, a golden, or silver, or

- ¹ दन्तान्तरगतं चान्नं शोधनेनाहरिच्छनैः ।
कुथ्यादनाहतं तद्धि मुखस्यानिष्टगन्धतां ॥

Suśruta Saṁhitā, I. xlvii.

- ² एवं भूक्त्वा समाचारमद्रुचयहणं पूर्व्वकम् ।
भोजने दन्तलग्नानि निर्हृत्याचमनं चरेत् ॥
दन्तान्तरगतं चान्नं शोधनेनाहरत् शनैः ।
कुथ्यादनिर्हृतं तद्धि मुखस्यानिष्ट गन्धताम् ॥
दन्तलग्नमनिर्हृत्य लिपं मन्येत दन्तवत् ।
न तत्र बहुशः कुथ्याद् यत् निर्हरणं प्रति ॥

Bhava Prakash, I. i.

³ Beal's Records of the Buddhist Religion, Trans. from Hiuen Tsiang, vol. I, p. 77.

wooden scraper is to be used. It should be ten *āṅguli* long and must be pliant and polished"¹. Caraka² mentions tongue-scraper of copper, lead or brass. Bhāvamisra³ also gives a similar description. It is to be used for scraping the deposit on the tongue. It is still commonly used in India.

RAZOR AND SHEARS. THE PRACTICE OF SHAVING.

Every one is recommended by Suśruta to have his beard shaved, hair trimmed and nails pared.⁴ Caraka⁵ also advises

¹ जिह्वानिर्लेखनं रौप्यं सौवर्णं वार्त्तमेव च ।

तन्मालापहरं शस्त्रं सृष्टुं दशाङ्गुलं ॥

Suśruta Saṁhitā, IV. xxiv.

² सुवर्णरूप्यताम्राणि त्रपुरीतिभयानि च ।

जिह्वानिर्लेखनानि स्युरतीक्ष्णान्यवृजृनि च ॥

जिह्वामूलगतं यच्च मलमुच्छ्वासरोधि च ।

सौगन्धं भजते तेन तस्माज्जिह्वां विनिर्लिखेत् ॥

Caraka Saṁhitā, I. v.

³ जिह्वानिर्लेखनं ह्येवं राजतं ताम्रजं तथा ॥

पाटितं सृष्टुं तत् काष्ठं सृष्टुं पतमयं तथा ।

“तत्काष्ठं” दन्तशोधनयोग्यं काष्ठम् ।

दशाङ्गुलं सृष्टुं स्निग्धं तेन जिह्वां लिखेत् सुखम् ।

तज्जिह्वा मलवैरस्य दुर्गन्धं जड़ता हरम् ॥

Bhāva Prakāśa, I. i.

⁴ पापीपशमनं केशनखरोमापमार्जनं ॥

हर्षनाशव-सौभाग्य-करमुत्साहवर्द्धनं ।

वाणवारं सृजावर्णं तेजोबलविवर्द्धनं ॥

Suśruta Saṁhitā, IV. xxiv.

तवादित एव नीचनखरोमा * *

Ibid.

⁵ पौष्टिकं वृष्यमायुष्यं शुचिरुपविराजनम् ।

केशशशुनखादीनां कल्पनं संप्रसाधनम् ॥

Caraka Saṁhitā, I. v.

us to shave regularly, that is thrice in a fortnight.¹ Bhāvamīśra says that this practice conduces to health, beauty, longevity and purity, and should be observed every fifth day². Razor is mentioned in the R̥gveda³ and in the Kaṭhopanīṣad of the White Yajur.⁴ In the Śatapatha Brāhmaṇa, we find the method of shaving well described.⁵ “Then (in shaving) are used a porcupine quill spotted in three places and a copper razor; that three-spotted porcupine’s quill resembles the three-fold science and the copper razor resembles the Brāhmaṇa; for Brahmā is fire, and fire is of reddish (lohita) colour, hence a copper (loha), razor is used”.

Again we read⁶:—“For impure, indeed, is that part of man where water does not reach him. Now at the hair and beard, and at the nails the water does not reach him; hence when he shaves his hair and beard, and cuts his nails, he does so in order that he may be consecrated after becoming pure.

¹ विः पचस्य केशश्मश्रुर्लोमनखान् संहारयेत् ।

Carakas Saṃhitā, I. viii.

² पञ्चरात्रात्रस्व श्मश्रुकेशलोमाणि कर्तयेत् ।

केशश्मश्रु नखादीनां कर्तनं सम्यसाधनम् ।

पौष्टिकं धन्यमायुष्यं शौचकान्तिकरं परम् ॥

“सम्यसाधनम्” शोभाजनकम् ॥

Bhāva Prakaśa, I. i.

³ सं नः शिश्रीहि भुरिजोरिव चुरंरास्वरायो विमोचन ।

R̥gveda, 8 M. 4 S. 5 A. 7 A. 16 V.

⁴ चूरस्य धारा निशिता दुरत्यय दृग्मयधस्तत् कवयो वदन्ति ।

Kaṭhopanīṣad, I. iii.

⁵ Śatapatha Brāhmaṇa, II. 6. 4. 5.

⁶ Ibid. 111. 1.2.2.

3. Now some shave themselves all over, in order that they may be consecrated after becoming pure all over; but let him not do this. For even by shaving the hair of his head and his beard, and by cutting his nails he becomes pure; let him therefore shave only the hair of his head and his beard, and cut his nails.

4. In the first place he cuts his nails, first of the right hand, for in human (practice) those of the left hand (are cut) first, but with the gods in this manner. First he cuts those of the thumb—for in human practice those of the little fingers are cut first, but with the gods in this manner.

5. He first passes (the comb) through his right whisker—for in human (practice they comb) first the left whisker, but with the gods in this manner.

6. His right whisker he moistens first with the text “may this divine water be propitious unto me”.....

There upon he lays a stalk of sacrificial grass on (the hair of the whisker) with the text “O plant, protect me”..... Thereto he applies the razor, with the text “O knife, injure him not”.

8. Having cut off (part of the stalk and hair), he throws it into the vessel of water. Silently he moistens the left whisker; silently he lays the stalk of grass on it; and having silently applied the razor thereto and cut through (it and the hair) he throws them into the vessel of water.

He then hands the razor to the barber, and the latter shaves off the hair and beard. When he has shaved the hair and beard.....

10. He bathes.....

12. He steps out (from the water) towards the north-east, with the text "cleansed and pure I go forth from them ;"

13. He then puts on (a linen) garment etc."

"The Atharva-veda relates how, when the ceremony of shaving off his beard was performed on king Soma, Vāyu brought the hot water and Savitrī skillfully wielded the razor."¹

In para. 3, quoted above, we have evidence of the practice of depilation of the pubes which is here forbidden. There are six important rules and six minor rules of ordination for the female members or Śramanīs of the Buddhist order. One of the six minor rules is : A female must not shave the hair in any place but the head.² "Aristphanes, a contemporary of Hippocrates,³ Persius⁴ and Juvenal⁵ refers to the depilation of the pubes as being common among certain classes, and the early Christian Fathers deplore the practice. See also the remarks of Suetonius on the conduct of Domitian"⁶. Prosper Alpinus (16th century) "found the custom still prevalent among the Egyptian women"⁷. "The custom survived in France, and Italy in the 16th century"⁸.

KEŚA PRASĀDHANĪ OR COMB.

Suśruta directs us to comb the hair to free the head from dust,

¹ Macdonnell's Sanskrit Literature, p. 164.

² See I'Tsing, P. 97, Foot-note 3. Vinaya Saṃgraha Chap. xii.

³ Hippocrates, Ran. 516, Lys 89, 151.

⁴ Persius, iv. 37.

⁵ Juvenal, vii. 114.

⁶ Suetonius, xii.

⁷ Medicina Aegyptiorum, lli. xv.

⁸ Milne, Surgical Instruments &c., p. 90-91.

louse and dandruff.¹ Bhāvamiśra advises us to comb the hair every day to keep it clean, as it stimulates the growth of hair.² Caraka³ also recommends us to keep the hairs clean. The practice of combing the hair is very ancient; the Atharva-yeda mentions a comb with a hundred teeth.

LOOKING-GLASS.

The looking-glass should be constantly used as thereby the complexion is said to be improved and life prolonged⁴. For an account of the looking-glass of the ancient Hindus, see Mitra's Indo-Aryans⁵.

DRESS.

Silk, chintz and red clothes are good for the winter, for they are said to be useful for derangement of air and phlegm. Thin silk is cooling and is efficacious for biliary disorders; so it should be used during the summer. It should be coloured twany or red. White clothes are auspicious and are neither hot

¹ केशप्रसाधनी केश्य रजीजन्तु मलापह्म ।

Suśrutā Saṁhitā, IV. xxiv.

² केशपाशे प्रकुर्वीति प्रसाधन्या प्रसाधनम् ।

केश प्रसाधनं केश्य रजीजन्तु मलापहम् ॥

Bhāva Prakāśa, I. i.

³ साधूवेशः प्रसाधितकेशो * *

Caraka Saṁhitā, I. viii.

⁴ आदर्शालोकनं प्रोक्तं साङ्ख्यं कान्तिकारकम् ।

पौष्टिकं बल्यमायुष्यं पापलक्ष्मी विनाशनम् ॥

Bhāva Prakāśa, I. i.

⁵ The Indo-Aryans Vol. I, p. 240.

nor cold; therefore they should be worn during the rains¹. Caraka says that pure dress conduces to longevity, happiness and fortune².

UṢNĪSA OR HEAD DRESS.

Suśruta³ advises us to use a cap on our head which is thus protected from injury. Bhāvamiśra says that the habitual use of some form of covering for the head stimulates the growth of hair, increases beauty of the head and protects it from dust, draughts and accumulation of phlegm. Only light caps should be used as the heavy varieties derange bile and cause diseases of the eyes.⁴ For the diagrams of the various forms of turbans used by the ancient Hindus, see Mitra's Indo-Aryans.⁵

- ¹ कोशियौर्षिक वस्त्रञ्च रक्तवस्त्रन्तथैव च ।
 वातश्लेष्महरन्तु शीतकाले विधारयेत् ॥
 “कोशियं” पशाम्बरं वसत्रवस्त्रञ्च ।
 मेध्यं सुशीतम्पित्तघ्नं कषायं वस्त्रमुच्यते ।
 तद्धारयेदृणकाले तत्रापि लघु शस्यते ॥
 कषायह्नीकटी इति लोके, कषाय रागरक्तं वा ।
 शुक्लान्तु शुभदं वस्त्रं शीतातप निवारणम् ।
 नचोष्णन्नचवा शीतन्तु वर्षासु धारयेत् ॥

Bhāva Prakāśa, I. i.

- ² काम्यं यशस्यमायुष्यमलक्ष्मीघ्नं प्रहर्षणम् ।
 श्रीमत् परिषदं शलं निर्मलाम्बरधारणम् ॥

Caraka Saṁhitā, I. v.

Bhāva Prakāśa, I. i.

- ³ पवित्र केशसुष्णीषं वातातपरजोऽपहं ।

Suśruta Saṁhitā, IV. xxiv.

- ⁴ उष्णीषं क्षान्तिहृत्केश्यं रजोवात कफापहम् ।

लघु तच्छस्त्रे यस्माद् गुरु पित्तविरोधकम् ॥

Bhāva Prakāśa, I. i.

- ⁵ The Indo-Aryans, Vol. I, p. 220.

CHATRA OR UMBRELLAS.

Suśruta says: Umbrellas are useful for protecting men from the rains, draughts, glare of the sun, exposure to cold, and dust. They are auspicious and are beneficial to the eyes¹. Caraka² advises us to use it as it protects us from the sun, rain &c. Bhāvamīśra³ also describes its efficacy similarly. Umbrella is one of the insignia of royalty in India, and is always held over the heads of kings as shown in the Sanchi and Amarāvati sculptures⁴. It is still commonly used in India.

YASTI OR STICKS.

Caraka⁵ directs us to use a stick as a support. Suśruta says: "By using sticks, a man gains in strength, prowess and manliness. He becomes courageous, patient and forbearing. He can stand erect and is not troubled by any fear"⁶. It

¹ वर्षानिलरजोघर्म हिमादीनां निवारणं ।

वण्य चक्षुष्य मौञ्जस्यं शङ्करं कृत्वधारणं ॥

Suśruta Saṁhitā, IV. xxiv.

² द्रुतेर्विधमनं वल्यं गुप्तावरणशङ्करम् ।

वर्षानिलरजोऽम्बुघ्नं कृत्वधारणमुच्यते ॥

Caraka Saṁhitā, I. v.

³ कृत्वस्य धारणं वर्षातपवात रजोऽपह्नम् ।

हिमघ्नं क्षितमच्छाद्य माङ्गल्यमपि कीर्तितम् ॥

Bhāva Prakāśa, I. i.

⁴ See Indo-Aryans, I, p. 266.

⁵ खलतः संप्रतिष्ठानं शब्दणाच्च निमृदनं ।

अवष्टम्भनमायुष्यं भयघ्नं दण्डधारणम् ॥

Caraka Saṁhitā, I. v.

⁶ युगः सरौघपथ्याल विषाणिभ्योभयापहं ।

यमघलन दीघघ्नं स्थविरेच प्रशस्यते ॥

सन्वीक्षाहवल्क्षैर्य धैर्यवीर्यं विवर्द्धनम् ।

अवष्टम्भकरश्चापि भयघ्नं दण्डधारणं ॥

Suśruta Saṁhitā, IV. xxiv.

protects a man from dogs, snakes &c. Bhāvamīśra¹ apparently quotes these verses from Suśruta.

UPĀNAHA OR SHOES.

The ancient Hindus used two kinds of shoes, made of wood and leather. The wooden pādukā is recommended to be used before and after dinner². The good effects claimed by its use are, an increase of the power of vision, strength and longevity.³ When travelling, the upānaha or leather shoes are to be used. Besides the advantages mentioned above, shoes are very comfortable to the travellers and prevent many diseases of the feet⁴. If any one often travels barefooted, he feels out of sort, his senses fail, vision becomes impaired and his expectation of life is reduced.⁵

¹ Bhava Prakāśa, I. i.

² पादुकारोद्वेगदुर्व्यात् पूष्यं भोजनतः परम् ।
पादरोग हरं वृष्यं चक्षुष्यञ्चाशुषो हितम् ॥

Bhāva Prakāśa, I. i.

³ चक्षुष्यं स्पर्शनहितं पादयोर्व्यसनापहम् ।
वृष्यं पराक्रममुखं वृष्यं पादवधारणम् ॥

Caraka Samhitā, I. v.

⁴ पादरोगहरं वृष्यं रचोघ्नं प्रीतिवर्धनम् ।
मुखप्रचारमोजस्यं सदापादवधारणम् ।
अनारोग्य मनायुष्यं च वृष्यं रचोघ्नं प्रीतिवर्धनम् ।
पादाभ्यासनुपानङ्गां सदा चक्रमणं नृणां ॥

Suśruta Samhitā, IV. xxiv.

⁵ उपानधारणं नेत्रमायुष्यं पादरोगहृत् ।
मुखप्रचारमोजस्यं वृष्यं परिकीर्तितम् ॥
पादाभ्यासनुपानङ्गां सदा चक्रमणं नृणां ।
अनारोग्य मनायुष्यमिन्द्रियघ्नं मण्डितम् ॥

Bhāva Prakāśa, I. i.

The Hindus wore sandals like the ancient Greeks. They also used boots, which look like the modern boots used by Europeans. Buddha gave the Bhikkhus permission to wear boots or shoes, with thick lining¹. Hinen Tsiang² says that "here (Avanti) Tathagatha gave permission to the Bhikkhus to wear kih-fu-to (boots)." For an account and figures of ancient boots used by the Hindus, see Indo-Aryans.³

VYĀJANĪ AND CĀMARA. THE FAN.

The fan was used for airing the patients to drive away flies.⁴ Suśruta mentions the cāmara *i.e.*, the tail of the Thibetan yolk (*Bos grunnius*) to be used as a fan. "It soothes the inflammation of boils and also acts as a fly-brush to prevent infection of the open wound"⁵. The cāmara is also one of the insignia of royalty and as such we have many representations of it in the sculptures of ancient India⁶. For diagrams of the ancient fan, see Indo-Aryans⁷.

Caraka directs us to use a kulā or fan to winnow corn, prepared from the kāśa (*Saccharum Spontanum*) to resuscitate a still-born child⁸.

¹ Mahavagga, varga 13 ff 6. S. B. E. vol. xvii. p. 35.

² Beal's Records. of Buddhist Religion, vol. II. p. 280.

³ Indo-Aryans, Vol. I, p. 123-6.

⁴ 'वालव्यजन मौजस्य' मलिकादीनपोहति ।

शेषदाह यमस्वेद मूच्छाप्नो व्यजनानिलः ॥

Suśruta Saṁhitā, IV. xxiv.

⁵ व्यजेत वालव्यजनेर्ब्रणं नच विषट्ठयेत् ।

Ibid, I. xix.

⁶ See Indo-Aryans, vol. II, p. 267-70.

⁷ For diagrams, see Indo-Aryans, vol. I, p. 263.

⁸ तथा संक्षेपिहितान प्राणान् पुनर्लभेत कृष्णकपालिकायुष्मे चैनमभिनिष्पुनीयाद्-
यश्चेत् स्यात् यावत् प्राणानां प्रत्यागमनं तत्तत्सर्वमेवकुर्वः ॥

Caraka Saṁhitā, IV. viii.

Bhāvamiśra¹ mentions fans made of the following materials:— palm leaf, bamboo, yolk's tail, cloth, peacock's feather and cane. He attributes peculiar properties to each fan.

Rājavalabha says² that "the palm-leaf fan overcomes disturbances of all the three humours, and is light and agreeable; the bamboo fan causes heat and irritability, and promotes inordinate secretion of the two humours—air and bile; the cane, cloth and peacock's feather fans, overcome disturbances of the three humours; the hair fan is invigorating etc."

The Buddhist Bhikṣus used the palm-leaf fan. "Not unfrequently there is added a lotus-leaf shaped fan, made from a single frond, with an edging of bamboo or light wood, and furnished with a handle fashioned like the letter "S". The palm from which the leaf is taken, is also that used for the mss., namely the Talipot; hence the name Talponi given to the Bhikkhus by the early Portuguese adventurers in Burma. When he attended a meeting at which women are likely to be present, every Bhikkhu must have the fan."³

¹ व्यजनस्थानिको दाह रवेदमूर्च्छा शमापहः ।

तालवृन्तभवो वातस्त्रिदोषशमको मतः ॥

वंशव्यजनजस्तूष्णी रक्तपित्तप्रकोपणः ।

चामरो वस्त्रसम्भूतो माधूरो वेदजस्तथा ॥

एते दोषजिता वाताः स्निग्धा हृद्याः सपूजिताः ।

Bhāva Prakāśi, I. i.

² तालव्यजनगुणः—त्रिदोषशमनत्वम् । लघुत्वञ्च ॥ वंशव्यजनगुणः—रूक्षत्वम् ।

उष्णत्वम् । वायुपित्तकारित्वञ्च ॥ वेदवस्त्रमथूरपुच्छव्यजनगुणः—त्रिदोषनाशित्वम् ।

वालव्यजनगुणः—तेजस्करत्वम् । मलिकादि निवारकत्वञ्च ।

Rājavalabha.

³ The Way of Buddha, p. 53-54.

FILTERS.

Filters were used by the Hindus and are recommended to be made of an earthen or metallic vessel, the mouth being closed by a piece of cloth tied round its neck.

If the water be filthy, Suśruta¹ advises us to purify it by boiling it or by exposure to the sun; or by throwing hot iron balls, sand or clay balls into the water and then allowing it to cool. Such purified water should be scented with the flowers of Nāgakeśara (*Mesua Ferrea*), Campaka (*Michelia Champaca*), Utpala (*Nymphaea Stellata*) and Patala (*Bignonia Snavicolens*).

Suśruta mentions seven means of purifying polluted water², viz.,

1. Kafaka phala or nirmālaya or seeds of *Strychnos Potatorum*.
2. Gomedaka or a kind of gems.
3. Viṣagranthi, or root of *Nelumbium Speciosum*.
4. Śaivālamūla or root of *Vallisneria Spiralis*.
5. A piece of cloth.
6. Pearls.
7. Precious Stones and crystals.

¹ व्यापन्नानामग्रिकथनं सृष्टातपप्रतापनं ततायःपिण्डसिकतालोप्राणं वा निर्व्यापनं प्रसादनञ्च कर्त्तव्यं नागचम्पकीत्यलपाटलापुष्पप्रभृतिभिर्वाधवासनमिति ।

Suśruta Samhitā, I. xlv.

² तत्र सप्तकलुषस्य प्रसाधनानि भवन्ति । तद्यथा । कतकमीमदकविषयस्थिशैवालसूल-
वस्त्राणि सुक्तामणिश्चेति । पञ्चनिक्षेपणानिभवन्ति । तद्यथा । फलकं दण्डकं सुञ्जवल्लय
उदकमञ्चिकाश्लिष्येति । सप्तशीतिकरणानि भवन्ति । प्रवातस्थापनमुदकप्रक्षेपणं यष्टिका-
भामणं व्यजनं वस्त्रोद्धरणं वानुका प्रक्षेपणं शिक्याबलस्वनश्चेति ।

He mentions five kinds of means for preventing contact of the water vessel with the earth' :—

1. Phalaka or planks as of Śālmali wood.
2. Tryastaka or octogonal tripod of wood.
3. Muñjvalaya or circular pad of Saccharine Muñja.
4. Udakamañcikā or a raised framework of cane and bamboo.
5. Śikya or a loop suspended by three strings.

He mentions seven ways of cooling water :—

1. Exposure to air.
2. Sprinkling water on the vessel.
3. Stirring the water with a rod.
4. Fanning the water.
5. Filtration through cotton fabrics.
6. Putting the vessel of water on a sand bed.
7. Suspension of the vessel in a loop.

He advises us to use rain water filtered through a broad piece of white and clean cloth². In collecting water from the rivers and ponds, the Hindu females still use a kalasī or earthen vessel, the mouth being closed by a piece of cloth.

¹ In the English translations of the *Suśruta Saṁhitā*, Bibliotheca Indica, Dr. Cattopādihāya translates the passage incorrectly. He misunderstood the terms phalaka, &c. to be remedial agents, necessary in the proliferation of water.

² गाङ्गं पुनः प्रधानं तदुपाददीताश्चयुजे मासि शुचिशुक्लवित तपटेकदेश्च्युतमथ वा हर्म्यगतलपरिषष्टमन्यैर्वा शुचिभिर्भाजनैर्गृहीतं ।

Suśruta¹ deprecates impure water as injurious to the human system and advises us not to drink or bathe in such water as there is always the risk of being speedily affected with many diseases.

“It (filter) forms one of the eight sacred utensils necessary for a sramana of the Buddhist order. It is a strainer or water-dipper—an apparatus for filtering the water which he drinks, so that he may not, even unwillingly, take animal life”²

One of the six requisites of a Bhikṣu is *Parisṛāvana*, a water-strainer³.

WATER VESSEL.

To store water, Suśruta mentions vessels of gold, or silver, or earth⁴.

“The clean water is kept separately from water for cleansing purposes (*lit.* ‘touched’ water), and there are two kinds of jars (*i.e.* *kundi* and *kalasa*) for each. Earthenware or porcelain is used for the clean jar, and the jar, for water for cleansing purposes (*lit.* ‘touched water’) is made of copper or iron. The clean water is ready for drinking at any time, and the ‘touched’ water for cleansing purposes after having been to the urinal.

व्यापन्नं वर्जयेन्नित्यं तोयं यद्वाप्यनार्त्तं ।

दोषसञ्जनं ह्ये तन्नाददीताहितन्तु तत् ॥

व्यापन्नं सलिलं यस्तु पिवतीहा प्रसाधितं ।

अथथु पाण्डुरोगञ्च त्वग्दोषमविपाकतां ॥

आसकासप्रतिश्यायग्लग्लोदरानि च ।

अन्यान् वा विषमान् रोगान् प्राप्नुयात् क्षिप्रमेव च ॥

Suśruta Saṁhitā, I. xlv.

² The way of Buddha, p. 53.

³ 1 Tsing, ch. x.

⁴ सौवर्णे राजने मन्त्रये वा पात्रे निदध्यात् तस्माज्जकालमुपयुञ्जीत तस्यालानि भौमम् ।

Ibid.

The clean jar must be carried in a clean hand, and be placed in a clean place, while the jar for the 'touched' water should be grasped by the 'touched' (or 'unclean') hand and be put in an unclean (or 'touched') place. The water in a pure and fresh jar can be drunk at anytime; the water in any other jar is called 'special water' (more *lit.* seasonable water *i.e.* water to be used at certain prescribed times, probably kâlodaka)."¹

BATHING.

The Hindus in their daily life do not eat without having first washed themselves in a bath. They always use a bathing-sheet and this ancient practice is still followed.

Bhāvamiśra says² : "Bathing stimulates the appetite, virile power and strength, prolongs life, allays thirst and burning sensation, cures eczema, and washes out dirt and perspiration."

Besides the ordinary bath, there is some evidence of the use of a medical bath to cure diseases. I'Tsing says³ : "The World-honoured One taught how to build a bath room, to construct a brick pond in an open place, and to make a medical bath in order to cure a disease. Sometimes he ordained the

¹ I'Tsing, ch. vi.

दीपनं दृष्यमायुष्यं स्नानं भोजनं वनप्रदं ।
 कण्डुमलशमःस्वेदतन्द्रा लङ्घनाह पापनुत् ॥
 बाह्यैश्च मेकैः शीतोद्यौ रुग्णान्तराति पीडितः ।
 नरस्य स्नातमात्रस्य दीप्यते तेन पावकः ॥
 शीतेन पयसा स्नातं रक्तपित्तप्रशान्तिकृत् ।
 तद्दीव्येन तोयेन वल्यं वातकफापहम् ॥
 शिरः स्नानमवच्छेद्य मल्युष्णेनाम्बुना सदा ।
 वातघ्नेष्वप्रकोपेत् हितं न च प्रकीर्तितम् ॥

Bhāva Prakāśa, I. i.

² I'Tsing, ch. xx.

whole body to be anointed with oil, sometimes the feet to be rubbed with oil every night, or the head every morning ; for such a practice is very good for maintaining clear eyesight and keeping off the cold." "Bathing should always take place when one is hungry. Two kinds of benefits are derived by having meals after bathing. First, the body is pure and empty, being free from all dirt, second, the food will be well digested, as the bathing makes one free from phlegm or any disease of the internal organs. Bathing after a good meal is forbidden in the 'Science of Medicine' " (Kikitsā-Vidyā).

DRINKING VESSEL.

Scented water is advised to be drunk out of cups made of gold, or silver, or copper, or bell-metal, or lapis lazuli or earth.¹ Bhāvamiśra² also mentions cups of the same materials.

"To drink from a jar holding it upright in front is no fault ; but drinking in the afternoon is not permissible. A jar must be made to fit one's mouth ; the top of the cover should be two fingers high ; in it a hole as small as a copper chopstick is made.

Fresh water for drinking must be kept in such a jar. At the side of the jar there is another round hole as large as a small coin, two fingers higher than the drinking-mouth. This hole is used for pouring in water ; two or three gallons may be put in it. A small jar is never used.

¹ See foot-note 2, P. 65.

² जलपावन् ताम्रस्य तदभावे षट्दोहितम् ।
पवित्रं शीतलं पात्रं गठितं स्फटिकेन यत् ॥
काचैर्न रचितम् इत्यथ वैदूर्यं सन्धवम् ।

If one fear that insects or dust may enter in, both the mouth and the hole may be covered by means of bamboo, wood, linen, or leaves. There are some Indian priests who make jars according to this style. In taking water the inside of the jar must be first washed in order to get off any dirt or dust, and then fresh water must be poured in.

A priest who travels, carries his jars, bowl, necessary clothes, by hanging them from shoulders over his cloak, taking an umbrella in his hand. This is the manner of the Buddhist priests in travelling¹."

DINNER SERVICE.

Suśruta² advises us to use different kinds of vessels for distributing the various kinds of food :—

Iron vessels for ghee or clarified butter.

Silver vessels for drinks, soups and gruels.

¹ T'sing, ch. vi.

² घृतं कार्णामयसि दयं पेया दयातु राजते ॥
 फलानि सर्वभक्ष्यांश्च प्रदद्याद्देहलक्ष्णं च ।
 परिशुक्लप्रदिग्धानि सौवर्णेषु प्रकल्पयेत् ॥
 प्रद्रवाणि रसाश्चैव राजतेषूपह्वारयेत् ।
 कट्वराणि खडांश्चैव सव्भान् श्लेषु दापयेत् ॥
 दद्यात्ताम्रमये पात्रे सुशीतं सुग्रहं पयः ।
 पानीयं पानकं मयः सव्भयेषु प्रदापयेत् ॥
 काचस्कटिकपात्रेषु शीतलेषु शुभेषु च ।
 दद्याद्दूर्यपात्रेषु रागषाडवसङ्कान् ॥
 पुरस्ताद्विमले पात्रे सुविकीर्णे मनोरमे ।
 सूदः सुपीदनं दद्यात् प्रदेहांश्च सुसंस्कृतान् ॥

Plantain leaf vessels for fruits and sweetmeats.

Gold vessels for flesh.

Stone vessels for whey.

Copper vessels for milk.

Earthen vessels for water, sherbets and wines.

Glass, crystal, lapis lazuli vessels for rājsāḍava and saṭṭaka.

In the Bhāva Prakāśa¹ we have a detailed description on the subject—‘A dinner service of gold is the best from a medicinal point of view, and it is supposed to be the best tonic for the eye. Eating out of silver is equally efficacious for promoting hepatic functions. A service of zinc improves the intelligence and appetite. Food served in brass utensils promotes wind and heat, but cures phlegmatic disorders and expells worms. The use of steel or glass vessel cures chlorosis, jaundice and intumescence. A stone or clay service brings on poverty. Wooden plates are good appetisers, but help the secretions of phlegmatic humour. The use of certain leaves as plates acts as an antidote against poisons. When at dinner, a water jug with a cup should be placed on the right hand. A copper vessel is the best for the purpose. The next best is an earthen pot. Vessels made of crystal and lapis lazuli are also pure and cooling’.²

¹ आशये काचपात्रे च भोजनं सिद्धिकारकम् ।

शय्य पाण्डुरहरं वल्यं कामलापहसुप्तमम् ।

शैल्यै मृत्पात्रे पत्रे भोजनं शीनिवारणम् ।

दाहहृत्वं विर्षेण रुचिर्दंष्ट्राकारितु ।

पात्रं पत्रमथं रुच्यं दीपनं विषपापनुत् ॥

Bhava Prakāśa, I. i.

² History of Aryan Medical Science, p. 64-5.

SPOONS.

P'Tsing says¹ : “As to the mode of eating in the West, they use only the right hand, but if one has had an illness or has some other reason, one is permitted to keep a spoon for use.”

SPITTOONS.

Spittoons were commonly used by the ancient Hindus, and Caraka² mentions it as one of the things necessary for the sick room. It is also mentioned in the Mohāvagga³: “And the sethe's wife spat it out into the spittoon.” Fa-Hian⁴ noticed a “stone spitting vessel in this country (Kie-sha) belonging to Buddha.”

BEDPANS AND URINALS.

The bedpan and urinal were also used by the patients in ancient times. Caraka mentions them to be necessary in a sick room.⁵

PUS BASINS.

Metallic basins marked with different measures were used for holding discharges after operations. In the Aśvavaidyaka⁶

¹ P'Tsing, ch. xvi.

² चोपन्यस्तश्चाङ्गारं प्रतिग्रहणम् ।

* * * *

प्रतिग्रहणंश्चैव चारयेत् ॥

Caraka Saṁhitā, I. xv.

³ Sacred Books of the East. VIII. i. II.

⁴ Beal's Records, vol. I. Introduction, xxviii.

⁵ See Page 36 and foot-note 1, P. 34.

⁶ प्रदेशं लोमशे नित्यं लोमान्युतपायं विधयेत् ।

प्रमाणार्थं च पाणिषत् रक्तं गृह्णाति बुद्धिमान् ॥

Aśvavaidyaka, XV. verse 30.

blood let out in the operation of phlebotomy, is recommended to be collected in a basin, so that the quantity may at once be determined.

PESTLE AND MORTAR.

Pestle and mortar are mentioned in the R̥gveda for preparing the Soma juice.¹ And their use in pharmacy was well-known to the ancients.

Besides the pestle and mortar of pharmacy, we find mention of a large wooden pestle used in reducing dislocation by Suśruta.² Caraka says that two pestles and motars should be kept in a lying-in-room, the object being to allow the woman some kind of work; and then she will not lie down idly on her bed if there be any delay in the delivery of the child³. Suśruta also recommends it⁴. "The mortar (ulukhala) and pestle (muśala) are to be made of very hard wood, viz., both of Varana wood (Crataiga Roxburghii), or the mortar of Palāśa wood (Butea Frondosa), and the pestle of Khadira wood (Acacia Catechu). The former

¹ उलूखलसुतानामविट्टं जन्मलः ॥

* * * *

यच्चिद्वि त्वं गृहं गृह उलूखलकं युज्यसे ।

R̥gveda, 1 M. 28 S. 1 & 2 R.

² See foot-note 6, P. 172.

³ See P. 39, and foot-note 1, P. 40.

मा चेदावीभिः संक्षिप्यमाना न प्रजार्थताथेनां ब्रूयात् उत्तिष्ठसूषलमन्यतरञ्च गृह्णीष्वानेनेतदु-
दूखलं धान्यपूर्णं महर्म्हं हरधिजहि मुहर्म्हं हरवजृम्भस्व चंद्रमस्व चालारालरा इत्येवमुपदिश्यन्त्यके ।

Caraka Samhitā, IV. viii.

⁴ कालातीतम्यायिनि गर्भं विशेषतः सधान्यमुदूखलंभूषलेनाभिहृत्याद्विषमे वा यानासने
सेवेत ।

Suśruta Samhitā, III. x.

is to be of the height of the knee and the latter three aratnis (cubits) long¹."

On the inner face of the left pillar in the eastern gate of Sanchi Tope, there is a beautiful representation of a kitchen scene, in which the ancient mortar and pestle are shown. "The mortar and two-handed pestle same as those in use at the present day in India. The mortar (okhli) is exactly the same as the Greek *ζυγην*, and the Roman *pila*; and the pestle (musar) is the same as the Greek *Κόπριον*, and the Roman *pilum*"²

The pestle and mortar used in pharmacy was called *āsmabhālam*. It is still used to pulverise medicaments, and is made of iron or brass.

In the *Mahāvagga*³ we find a reference to the pestle and mortar. "I allow, O Bhikkhus, the use of a *chunam* as a medicine by whomsoever has the itch, or boils, or a discharge or scabs, or whose body is ill smelling, and to those in health the use of dry dung, and of clay, and of coloring matter. I allow, the use, O Bhikkhus, of a pestle and mortar" (*udukhala// nusalañ ka*).

SIEVES, STRAINERS AND FILTERS.

There is evidence that cloth seive was used by the Hindus in ancient days, we find it mentioned in the *R̥gveda*⁴. The purpose of straining and filtering solid and liquid medicines respectively is mentioned to have been served by two or

¹ Schol. on *Katy.* 1.3.3.6. *footnote.* *Śatapatha Brāhmaṇa* (Sacred Books of the East, 1.1.4.8.)

² Cunningham's *Bhilsa Topes*, p. 207.

³ *Mohāvāgga* VI. 9. 2.

⁴ *R̥gveda*, 10m. 71s. V 2

three layers of a piece of cloth. And we know that in the prehistoric Soma rites, it "was pressed, passed through a seive, mixed with milk, and offered as the main oblation".

The reference to a cloth sieve, we find in *Mohāvagga*¹ : "Now at that time the Bhikkhus who were sick had need of sifted chunam as medicine.

They told this thing to the Blessed One.

"I allow, O Bhikkhus, the use of a chunam sieve".

They had need of the chunam very fine.

"I allow, O Bhikkhus, the use of a cloth sieve".

Pavitra was used in the Vedic times². It was a filter. Wilson translates it : "Trough the purifying filters".

COLD AND HOT APPLICATIONS.

To relieve colic pains, vessels made of silver, copper or precious stones, containing cold water, are directed to be placed upon the part or better upon the navel³. Besides these, leather vessels containing cold water are also directed to be used for reducing the temperature in dilirium tremens.⁴

¹ *Mohāvagga* VI. 10. 1.

² मध्वः पुनानाः कविभिः पवित्रैर्दुग्भिर्हिन्वंत्यक्तुभिर्धनुवीः ॥

R̥gveda, 3m. 31 s. 16 Rk-

अंशं दहन्ति हस्तिनो भरिर्मेमध्वः पुनन्ति धारया पवित्रैः ॥

Ibid., 3m. 36 s. 7 Rk.

³ मणिराजत ताम्रानि भाजनानि च सञ्चक्षः ।

वारिपूर्णानि तान्यस्य यत्नस्योपरि निक्षिपेत् ॥

Suśrāta Saṁhitā, VI. xlii.

⁴ हिमराजत क्रांस्यानां पावाणां शीतवारिभिः ।

पूर्णानां हिमपूर्णानां दृतानां पवनाहताः ॥

Caraka Saṁhitā, VI. xii.

Heat is directed to be applied to the patient's body in various ways¹ :—

I. Tāpasveda :—palm of the hand, brass dish, sand, cloth, potsherd &c. are the means mentioned for applying heat to the body.

II. Uṣṇasveda :—potsherds, stone, bricks, or iron balls are to be heated to redness and then water is to be sprinkled upon them. The part to be fomented is covered by a wet piece of thick lint and then the heated materials are to be applied over it. Or heat may be applied by means of a narrow vessel containing hot decoctions. The vessel is to be surrounded by a piece of

¹ चतुर्विधः स्वेदस्तद्वयथा । तापस्वेद उष्णस्वेद उपनाहस्वेदोद्वेगस्वेद इति ।
अथ सर्वस्वेदविकल्पावरोधः ॥

तत्र ताप-स्वेदः । पाणि कांस्यकन्दकपाल वातुकावस्त्रेः प्रयुज्यते शयानस्थचाङ्गतापो बहुशः
खादिराङ्गैरिति । उष्ण-स्वेदस्तु कपाल पाषाणकालोह-पिण्डान्नविषर्णानां रासिहेदस्तु
द्रव्येर्वाते राद्रास्तक परिवेष्टितमङ्ग-प्रदेशं स्वेदयेत् । मांसं रसं पयोदधि धान्याम्रवातहृ-
पवभङ्गं काष्ठं पूर्णं वा कृन्मीमनुतप्तं प्राह्व्योष्माणं गृह्णीयात् । पार्श्वं छिद्रेण वा कुम्भेनाधो-
मुखेन तस्य मुखमभिसम्प्राप्य तस्मिन् छिद्रे हस्ति शृङ्गाकारं नाडीं प्रणिधाय तम् स्वेदयेत् ।

मुखोपविष्टं स्वभक्तं गुरुं प्रावरणाढ्यं ।

हस्तिशृङ्गिकया नाडा स्वेदयेद्वात-रोगिणं ॥

मृदा सर्वाङ्गगा ह्येषा नच क्रियाति मानवं ।

व्यासार्कसाचा विवक्रा हस्ति हस्तं समाकृतिः ॥

स्वेदनार्थं हिता नाडी केलिञ्ची हस्ती शृङ्गिका ।

* * * * *

उपनाहं स्वेदस्तु वातहृग्मूलकक्लेरस्तु पिष्टैर्लवणं प्रगाढैः सुखिग्धैः सुखोष्णैः प्रदिह्य
स्वेदयेद्बु । एवं काकोल्यादिभिः मृत्मादिभिस्त्रिणात्मैः सर्प कल्कैः कृशरा पायसोक्ताग्नि-
भिर्विषवारैः शाल्वैर्बर्वातमृत्वावनजैः स्वेदयेत् ।

द्रव स्वेदस्तु-वातहृग्द्रव्यकाष्ठं पूर्णं कोणं कटाहं द्रोण्यां वावगाह्य स्वेदयेत् । एवं पयोमांस-
रस-पुष-तैल-धान्याम्र-घृत-वसा मृत्पुष्पवाह्यैः सुखोष्णैः कषायैः परिषिञ्चेदिति ।

cloth to prevent the skin from being burnt. Or heat may be applied by the following device:—an earthen vessel or *kalasī* containing hot decoctions is to be closed; and the vessel is then to be inverted. Then a hole should be bored on its side, and a tube shaped like an elephant's proboscis is fitted to it; the vapour issuing from the tube is allowed to play on the part.

To apply vapour bath:—put the hot infusion of medicinal substances into an earthen vessel and close its mouth. Drill a hole into the side of the vessel and adapt a tube to it. The tube may be either metallic or wooden. The tube should be two hands (forearm and hand) long and made of three pieces; the end of the tube which should taper like a cow's tail must be six *aṅguli* long. The patient should be seated on a stool and well covered with cloth. The tube is then introduced inside the blanket, and thus the issuing vapours heat the whole body. (*Śārṅgadharma*¹).

Suśruta says that the tube should be half *byām* (*i.e.*, the distance between the two hands when extended) long, bent thrice and shaped like an elephant's proboscis. Sometimes a large stone slab is to be heated with burning wood of *Acacia Catechu*. Then after removing the ashes, the patient is directed to lie upon it. A tent or cloth-cover having four doors is sometimes required for the patient to sit in, and heat is applied by burning wood outside it.

¹ अथवा वातनिर्नाशिद्रव्यकाथरसादिभिः ।

उष्णैर्वटं पूरयित्वा पात्रे द्विद्वि विधाय च ॥

विमुद्रासं विखण्ड्य धातुजां काष्ठजां तथा ।

षडङ्गुलास्यां गोपुच्छां नाडीं युञ्ज्यात् विह्वलिकां ॥

मुखोपविष्टं सन्ध्यक्तं गुरुप्रावरणावृतम् ॥

हस्तौयष्टिकया नाद्या म्वेद्यैवातरोषिणम् ॥

Śārṅgadharma Saṃgraha, III, ii.

III. Upānahasveda or poultices :—roots of medicinal plants are to be pressed and formed into a paste with mustard, sesame etc. This is to be heated, put on a thin cloth and so applied.

IV. Dravasveda or hot bath :—the patient is to sit in a tub or vessel of hot water. Iron pails or tubs are recommended to be used by patients to take bath in some infusions. Śārṅgadharma says¹: The tub (droṇī) should be made of gold, or silver, or copper, or iron, or wood. The height and length of the tub should measure thirty-six aṅguli each. When the patient sits inside, the height of water should stand six aṅguli above the navel. A droṇī filled with oil is to be used for placing an unconscious patient in it to overcome the shock caused by fall, blows, fractures and other injuries.

Cakradatta² describes the four methods of applying heat, Bhāvamiśra also describes them similarly³. Hārīta, however, mentions seven methods of heat-application⁴.

- ¹ सौवर्णं राजतं वापि ताम्रमायसञ्च दाक्षजम् ।
कोष्ठकं तच्च कुर्वीताच्छायि षट्त्रिंशदङ्गुलम् ॥
आयामिन तदेवस्याञ्चतुष्कं मसृणं तथा ।
नाभेः षडङ्गुलं यावन्मग्नः काथस्य धारया ॥

Śārṅgadharma Saṁgraha, III. ii.

- ² तत्रैः सैकतपाणिकांस्थवसनैः स्वेदोऽथवाङ्गारक-
र्लपाद्वातहृरैः सहाम्नलवणस्नेहैः मुखोष्णैर्भवेत् ।
एवं तप्तपयोऽम्बुवातश्मनकायादिर्मकादिभि-
स्तेनैस्तोयनिषेचनोद्भवहृद्वाप्यैः शिलायैः क्रमात् ॥

Cakradatta, Svedādbikāra.

स्वेदश्चतुर्विधः प्रोक्तस्त्रयोऽथस्वेदसंज्ञितः ।
उपनाहो द्रवः स्वेदः स्वेदः वातार्तिहारिणः ।
तापस्वेद उष्णस्वेदश्च ताभ्यां संज्ञितः ।

Bhava Prokāśa, I. i.

स्वेदः सप्तविधः प्रोक्तो लोष्टस्वेदो वायस्वेदोऽग्निज्वालास्वेदः ।
षट्स्वेदो जलस्वेदो फणस्वेदो बालुकास्वेदश्च ।

Hārītā Saṁhitā, V. iv.

BALANCE OR MĀNADAṆḌA.

For weighing medicinal substances, the scales and balance are often mentioned. They mention a set of weights and measures to be used in weighing substances. Alberuni¹ describes the Hindu balance thus :—"The balance with which the Hindus weigh things, are *χαπιο τiorḡεε* of which the weights are immovable, whilst the scales move on certain marks and lines. Therefore the balance is called *tūla*. The first lines mark the unit of the weight from 1 to 5, and further on to 10; the following lines mean the tenths, 10, 20, 30, &c. In Fergusson's Tree and Serpent Worship we have a diagram of steel-yard, where a man is represented as stepping in the scale, apparently to weigh himself². The ordinary balance is still in common use amongst the *kavirājes* of the present day.

COLLYRIUM POTS.

The Hindus used to apply collyrium to their eyes, from a very early time. It is said to stimulate the growth of eye-lashes, brighten the lustre of the eye-balls and clean the pupil³.

Bhāvamiśra⁴ recommends us to use collyrium as it improves the visual power and cures many diseases of the eye. It is

¹ Alberuni's India, Trans. by Sachau, vol. 1, p. 146.

² The Tree and Serpent Worship, the pl. lxxxiii, fig. 1.

³ पञ्चलं विशदं कान्तममलोज्ज्वलं मण्डलं ॥

नेवमञ्जनं संयोगाद्भवेच्चात्मलं तारकं ॥

Suśrūtā Saṁhitā, IV, xxiv.

⁴ सौवीरमञ्जनं नित्यं हितमस्त्रोक्षतो भजेत् ।

लोचने भवतस्तेन मनोज्ञं सूक्ष्मदर्शनं ॥

“सौवीरं” श्वेतं सुरमा इति लोके प्रसिद्धम् ।

क्षेतोऽञ्जनं मतं श्रेष्ठं विगुह्यं सिन्धुसम्भवम् ॥

contra-indicated in patients suffering from fever, emesis, exhaustion, &c.

Suśruta mentions collyrium pots of different metals intended for different kinds of collyrium then in use —

gold	pots	for	sweet	collyrium.
silver	pots	for	acid	collyrium.
horn	pots	for	salt	collyrium.
copper & iron	pots	for	astrigent	collyrium.
lapis lazuli	pots	for	sour or acid	collyrium.
bell-metal	pots	for	bitter	collyrium.

He also mentions pots of ivory, or crystal, or coral, or horn, or conch-shell, or stone, or gold, or silver¹.

He also mentions a piece of bamboo for storing collyrium². A bamboo is still used by the poor for keeping oil in India. For a similar purpose the wood of Khadira (*Accacia Catechu*) is also

दृष्टेः कण्डूमलहरं दाहकृद रूजापहम् ।

अक्षोरुपावहस्यैव सहनेमारुतातपी ॥

नेत्ररोगा न जायन्ते तस्मादञ्जन माचरेत् ।

“श्रोतोऽञ्जनं” कृष्णसुरमा इति लोके प्रसिद्धं ॥ “विशुद्धं” गोधनं विनापि ।

“सिन्धुसम्भवम्” सिन्धुनाम पर्वतस्यैव सम्भवम् ।

रात्रौ जागरितः शान्तः क्षुद्धितो भुक्तवांस्तथा ।

ज्वरातुरः शिरःकातो नाक्षीरञ्जनमाचरेत् ।

Bhāva Prokāṣa, I. i.

¹ See foot-note 3, P. 67.

² कुञ्जकाशीकशालाखपियङ्गुनलिनोत्पलैः ॥

पुष्पैर्हरेण कृष्णाह्वापथ्यामलक संयुतेः ।

सर्पिर्भधयुतैश्चुम्बकवर्णनाड्यामवस्थितैः ॥

recommended¹. For storing oil, Dṛṣṭhavalā² mentions the use of vessels of stone or the horn of a lamb or iron.

MEDICINE GLASS.

Sukti or shell of mussel was used as medicine glass. The shell of the fresh water mussels unionacea is mentioned to be used for holding a dose of medicine for administering it to a patient³. They generally have equivalve, though not equisided, shells which are covered externally with a smooth brown epidermis and internally by a mother-of-pearl layer. Such a shell "is said to have been formerly much used in England by painters for holding their colour and so the commonest variety is termed unio pictoria. To apply oleaginous errhines, Suśruta⁴ recommends us to use metallic pots or the shell of mussel. It is still used in India for feeding the babies with milk and also for administering medicines to the patient. Heyne⁵ (1814) says that "according to the nature of the disender, the medicines should be taken out of gold, silver or brass vessels. But if these should not be at hand you may use iron or even earthen vessel."

¹ सैन्धवोपहितं युञ्जानिहितं वैशुगहरे ।

मर्दयिष्यद्वृष्टतञ्चाजं पिप्रल्यः सैन्धवं मधु ॥

रसमामलकञ्चापि पक्वं सम्यङ् निधापयेत् ।

कोशे खदिरनिर्माणे तद्वत् छुद्राञ्जनं हितं ॥

² See foot note, I. P. 67.

Suśruta Saṁhitā, VI. xvii.

³ तत उपसंस्कृतशरीरः प्रातः प्रातःकृत्याय पाणिशुद्धिमात्रं चौर्येण प्रतिसंस्त्रयोपयुञ्जीत ।

Suśruta Saṁhitā, IV. x.

⁴ वामहस्तं प्रदेष्टव्यं शीघ्रान्तिनालाशयं विशुद्धं खोतसि दक्षिण हस्तेन केहशुष्णान् तमं चतुर्धनं सुवर्णं तामसं पात्रं शुक्तिनामन्यतमं यं यत्क्या पितृना वा सुखीणां केहमद्रुतमासिञ्चेदयवच्छिन्न-भारं यथानेनेन प्राप्नोति ।

⁵ Dr. Heyne's Indian Tracts,

Ibid. IV. xl.

DROPPER.

The Hindus used a tent of cotton as a drop conductor. Cakradatta¹ advises us to drop medicines into the eyes thus:—the patient should be made to lie down in a place free from draught; the surgeon is to open his eye with the left hand, while with the right, he allows 10 or 12 drops of medicine to fall from a height of two aṅguli on the eye from a tent of cotton, immersed in medicine contained in a clean vessel.

GRIND-STONE.

Grind-stone to pulverise medicaments is mentioned. In the Mahāvagga² we find a reference to it. “I allow, O Bhikkhus, the use of a grind stone, and of another stone to grind upon” (pisana-sīlā ka pisana poto ka—Buddhaghosha).

STONE AND IRON MULLER.

For similar purpose a stone slab and iron muller are necessary to make pastes and powders of medicines. On the inner face of the left pillar in the eastern gate of Sanchi Topes, the kitchen scene is represented, in which “a fourth woman is seated grinding spices or condiments on the sil, or flat stone, with a bant or round muller³”.

KHAL OR ELLIPTICAL MORTAR OF STONE AND PESTLE.

To prepare medicines to be exhibited to the patients, a small

¹ निवातस्थस्य वामेन पाणिनीन्मील्य लोचनम् ।

यत्कौप्रलम्बयान्तेन पिचवर्त्या कनीलिके ।

दश द्वादश वा बिन्दून् द्वाङ्गुलादवसेचयेत् ।

Cakradatta, Āśotanecyāññama Adhikāra.

² Mahāvagga vi. 3.2.

³ Cunningham Cunningham's Bhilsa Topes, p. 206.

elliptical mortar is generally used when the medicines require to be thoroughly mixed with some excipient.

The following appliances, besides those mentioned before become necessary in pharmacy :—

1. Iron pails of various sizes.
2. Vessels of iron, copper, silver, brass and earth for storing medicines.
3. Spoons of wood or darvi ; large metallic spoon or hata.
4. Iron sandanīśa or pinchers.
5. Rods of wood or iron.
6. Blacksmith's bellows.
7. Ankuśa or hooks like the elephant driver's goad.
8. Iron hammer.
9. Earthen crucibles of different sizes.

CHAPTER IX.

THE CONCLUSION.

In the recent edition of the *System of Medicine*, Prof. Albutt¹ begins his article on the History of medicine with the following observations: "The medicine of Egypt and the East, extensive and intricate as it was, in so far as it was not Greek did not contain even the rudiments of science. To it Western medicine owes virtually nothing, and in this article at any rate, it may be disregarded". Prof. Osler² also speaks in the same strain: "Crude and bizzare among the primitive nations, these ideas of disease received among the Greeks and Romans a practical development worthy of these peoples. There have been systemes of so-called divine healing in all the great civilizations, but for beauty of conception and for grandeur of detail in the execution, all are as nothing in comparison with the cult of the son of Appolo, and of Æsculapius, the god of healing." "Scientific medicine, the product of a union of religion with philosophy, had its origin in a remarkable conjunction of gifts and conditions among the Greeks in the sixth centuries".

Such opinions remind us of an assertion of Sir William Jones³ "that there is no evidence that in any language of Asia there exists one original treatise on medicine considered as science". About a century has elapsed since the time of Sir William but we see that the same misconception still prevails in the minds of

¹ Albutt and Rolleston. *System of Medicine*, vol. I, p. 1.

² Osler and Mearns's *System of Medicine*.

³ Discourse xi. Sir William Jones's *Works*, Vol. I, p. 181.

the scholars. Macdonell¹ gives us a succinct account of the intellectual debt of Europe to the various branches of science and art of the Hindus but regrets that the genetic connection of Indian medicine with that of Greece can not at present be definitely settled. "The question as to whether Indian medical science in its earlier period was affected by that of the Greeks can not be answered with certainty, the two systems not having hitherto been compared with sufficient care." The European mind is quite naturally in the habit of tracing all knowledge to Greece, the fountain of all their knowledge in philosophy and science. But impartial writers are not wanting to vindicate the claims of the Hindus. So Wise remarks as follows² :—"Facts regarding the ancient history of medicine have been sought for only in the classical authors of Greece and Rome and have been arranged to suit a traditional theory which repudiated all systems which did not proceed from a Grecian source. We are familiar from our youth with classical history and love to recall events illustrated by the torch of genius and depicted on our memories ; and it requires a thorough examination of a subject, a careful weighing of new evidence, and a degree of ingenuousness not always to be found to alter early impressions. Still candour and truth require us to examine the value of new facts in history as they are discovered, so as to arrive at just conclusions". Royle maintains³ that "from the mixture, however, of much ignorance and absurdity with what is valuable, many will be apt to despise altogether the medicine of the East. But if it be recollected how long in Europe prevailed the influence of Galen,

¹ History of Sanskrit Literature, ch. xvi.

² Review of the History of Medicine. Introduction.

³ Antiquity of Hindu Medicine, p. 61.

as well as how many absurd formulas still figure in some continental pharmacopœas, as also how comparatively recent is the time since our own was so greatly improved; some feeling of humiliation will control the pride with which we now view the medical sciences". Neuberger says¹; "The medicine of the Indians, if it does not equal the best achievements of their race, at least nearly approaches them. and owing to its wealth of knowledge, depth of speculation and systematic construction, takes an outstanding position in the history of oriental medicine." It is no doubt unsatisfactory to find that such notions are still allowed to stand in the way of impartial conclusions by eminent men of science especially by those who write history of medicine. But it is not the fault of the historians alone, the fault lies with us for not having supplied them with adequate materials. Something has been done in this field of research by men like Wilson, Heyne, Ainslie, Royle, Dutt, Thacore Shaheb, Jolley, Hoernle and others, but it is nothing when compared to what is required to be done. To supply this want partially, we have endeavoured in this monograph to describe the surgical instruments of the Hindus, with a comparative study of the instruments of the Greek, Roman and Arab surgeons, and of the surgeons in modern times. By a careful study of this subject, we can not avoid the conclusion that the medicine of India though it was not Greek, contained the requirements of science and has a fair claim to be considered in the history of medicine. To it western medicine really owes something and so the subject has been studied and investigated thoroughly.

¹ Neuberger. *History of Medicine*. Trans. by Playfair. Vol. I. p. 437.

Apart from the usefulness of the study for collecting materials for the history of medicine, there are good reasons for a critical examination of the subject. The knowledge of the Hindus in medical science was by no means rudimentary. There is evidence to show that they were inferior to none in the quality or quantity of the knowledge of the science at that early age. Hoernle says:¹ "Its extent and accuracy are surprising when we allow for their early age—probably the sixth century before Christ—and their peculiar methods of definition." They practised dissection of human bodies and their anatomical studies have the mark of high order. "We have seen that they used various forms of surgical instruments. The Hindus cut for stone couching for the cataract and extracted the fœtus from the womb". They performed abdominal section, practised cranial surgery successfully and no region of the body was thought sacred to the knife. They repaired nose and ears by plastic operations, treated fractures and reduced dislocations, and were experts in performing amputations. They reduced hernia, cured piles and fistula-in-ano by surgical technique, and inoculated and vaccinated for small-pox. Field surgery was thoroughly understood and arrows were extracted with skill. They were acquainted with the circulation of the blood,²

¹ Hoernle's Osteology, Preface, P. iii.

² शृङ्गमिरिदं शरीरमात्मानं इव जलहारिणीभिः केदार इव च कूल्याभिरुपसृज्यते-
ऽनुगृह्यते चाकुञ्चन प्रसारणादिभिर्विशेषैः । द्रुमपत्रसेवनीनामिव च तासां प्रतानास्तासां
नाभिर्मूलं ततश्च प्रसरन्त्यङ्गमघस्त्रियं च ।

Saśruta Samhitā, III. vii.

देहस्योत्पत्तिरसृजो देहक्षेत्रेव धार्यते ।

रक्तं जीवस्य चाधारस्तस्माद्रवेदसृग्बुधः ॥

Bhāva Prakāśa, I. ii.

the distinction between the artery and vein,¹ the use of anæsthetics, the means of arresting hæmorrhage and the proper treatment of surgical wounds. They enumerated 107 vital parts of the body to be avoided, if possible, by the surgeon in practising his handicraft.²

In medicine they first propounded the humoural pathology. Though it seems fanciful in the light of modern culture, it must be admitted that no other theory has been attempted to explain the causation of disease in recent times. "They were the first nation who employed minerals internally and to them we owe the therapeutic use of mercury and arsenic in intermittents". They introduced massage, postural treatment and magnet in therapeutics. They excelled in chemistry and contrived many instruments for the preparation of chemical compounds. Atomic theory was discovered by Kaṇāda; and "they knew how to prepare sulphuric acid, nitric acid and muriatic acid, the oxide of copper, iron, lead (of which they had both the red oxide and litharge),

विस्त्रता द्रवता रागश्चलनं विलयस्तथा ।

भूम्यादिपञ्चभूतानामेते रक्ते गुणाः स्मृताः ॥

रक्ते दुष्टे भवेच्छीथो रक्तमण्डलमेव च ।

व्यथा दाहश्च पाकश्च कण्डूश्च पीडकोद्गमः ।

वृद्धे रक्ताङ्ग नेचत्वं शिराणां पूर्णता तथा ।

गात्राणां गौरवं निद्रा मेहो दाहश्च जायते ॥

Sārṅgadhara Saṁgraha, III. xii.

Bhāva Prakāśa, I. ii.

इन्द्रगोपप्रभं ज्ञेयं प्रकृतिस्थसमंहतम् ।

Sārṅgadhara Saṁgraha, III. xii.

गूढाः समस्थिताः स्निग्धा रोहिण्यः शुद्धशोणितम् ।

Aṣṭāṅga Hṛdaya Saṁhitā, II. iii.

सप्तोत्तरं मर्त्यशतं ।

Suśruta Saṁhitā, III. vi.

tin, and zinc ; the sulphuret of iron, copper, mercury, antimony and arsenic ; the sulphate of copper, zinc and iron ; and carbonates of lead and iron¹". The processes of solution, calcination and distillation were discovered by them.

They understood the action of drugs and no less than 500 classes of medicinal agents are enumerated and arranged according to their virtues in curing diseases, and their remedial agents have been collected from the vegetable, animal and mineral kingdoms. There are 41 different forms in which the medicaments may be exhibited to the patient. We have the earliest notice respecting zoology and botanical geography in their works. They had a complete nomenclature of diseases which are described minutely as regards their ætiology, symptomatology, diagnosis, pathology, prognosis and treatment.

Veterinary science was well known to them, and treatises on horses and elephants—*Aśvavaidyaka* and *Pālakāpya*² are still extant, and will repay perusal. Even there is a treatise on the treatment of plants and trees³. Thus we see that the Hindu medical science must not be condemned offhand and requires a careful and sympathetic research by scholars, before it can be excluded from the history of the science.

But I must be careful not to allow my enthusiast admiration carry me too far. It is quite true that the Ayurvedic system has its faults. It has been remarked that "it consisted of erroneous

¹ Elphinstone's History of India, 8th ed. p. 160.

² Another book on the medicine of elephants is quoted by Albernni. See Seelet's Preface to Indica, p. xl.

³ For the bibliography of the Āyurvedic books, see my work "Materials, Biographical and Bibliographical, for the History of Hindu Medicine". (In the

doctrines founded upon a most fanciful anatomy, physiology and pathology. Much indeed could hardly be expected of a science based upon an anatomy which taught that the navel "constituted a centre from which a vascular system, including 40 principal vessels originated"¹; upon a physiology which declared that these vessels were destined to convey blood, air, bile and phlegm to all parts of the body, and upon a pathology which maintained that disease depended either upon derangements of one or more of these humours or "upon the influence of good or evil spirits".² It must however be remembered that this criticism refers to a theory elaborated some 3000 years before. The idea that the navel formed the centre of the vascular system apparently had its origin in the foetal circulation³. The position of the heart was well-known and its function as a profeelling organ is

¹ यावत्सु सिराः काये सम्भवन्ति शरीरिणां ।
 नाभ्यां सर्वा निवहन्ताः प्रतन्वन्ति समन्ततः ॥
 नाभिस्थाः प्राणिनां प्राणाः प्राणान्नाभिर्वपायिता ।
 सिराभिरावृता नाभिश्चक्रमाभिरिवारकैः ॥

तासां मूलसिराश्चत्वारिंशत्तासां वातवाहिन्यो दश पित्तवाहिन्यो दश कफवाहिन्यो दश दश
 रक्तवाहिन्यः ।

Suśruta Saṁhitā, III. vii.

तस्यान्तरेण नाभेस्तु ज्योतिःस्थानं ध्रुवं स्मृतं ।
 तदा धमति वातस्तु देहस्तेनास्य वर्धते ॥

Ibid. III. iv.

² A course of lectures on the Principles and Practice of Medicine delivered at Calcutta Medical College. By Francis, 1868.

मातुस्तु खलु रसवह्नायां नाभ्यां गर्भनाभिनाडौ प्रतिवह्ना सास्य मातुराहाररस-
 वीर्यमभिवहति । तेनोपशेहेनास्याभिर्हृदिर्भवति ।

Suśruta Saṁhitā, III. iii.

described in the ancient books¹. In the later Tantras the origin of the nerves from the spinal cord and the brain is distinctly stated². The ancient Hindus, like the Babylonians, thought the heart to be the seat of the understanding, and the liver as the central organ of the blood. The Greeks were the most cultured nation at that age, and the knowledge of the two nations can be compared to our advantage. The Hindus did not share with the Greeks the belief that the uterus is "an animal within an animal" and that it can be attracted by pleasant smells and repelled by pungent substances"³. The humoural pathology was also the keystone of the Grecian system. The belief in the good and evil spirit was the only alternative to the pathologists when the microscope and the germ theory of diseases were unknown. It is highly creditable to the classical Greek physicians for banishing superstition from the practice of the art; but we know that the later Greek writers Aetius, Alexander and Paulus, and the Latin medical literature, were not free from its baneful influence. The belief in charms and miracles in the cure of diseases seems to be universal and is

¹ सरसः इत्युच्यते । तस्य च हृदयं स्थानं स हृदयाश्चतुर्विंशतीः धमनीरनुप्रविश्योईगा दश दश चाधोगामिन्ययतस्तस्मिन्निगमाः कृत्स्नं शरीरमहरहस्तर्पयति वईययि धारयति थापयति जीवयति चाट्टहेतुकेन कर्मणा ।

Suśruta Saṁhitā, I. xiv.

² द्वे च तिर्यक्गते नाडी चतुर्विंशति संख्यया ।

मेरुदण्डेस्थिताः सर्वे स्वे मणिगणादिव ॥

* * * *

जल्यमूलमधःशाखं वृक्षाकारं कलिवरं ।

यथान्नत्यदले तद्वत् शरीरे नाड्यस्थिताः ॥

Tantra

Paulus Aegineta, Adam's Commentary, Vol. I. P. 636.

working even at the present time. Adams says¹ that "considering the faith which many educated persons now repose in the virtues of galvanic rings and garters, the present generation has little ground for laughing at the credulity of our forefathers, with respect to amulets and other phylacteries".

In later times, attempts have been made to substitute other theories in the place of the humoural, and we know with what results. "Paracelsus substituted an equally baseless hypothesis, that the fundamental element of the human body were three principles: sal, the solid element; quicksilver, the liquid; and sulphur, the aerial. This formula was the badge of the Paracelsist school up to the end of the 17th century." Sylvius and Willi (17th century) of the Iatro-chemical school "referred most diseases to morbid matters or "acrimonies" produced by perverted secretions, and these being sometimes too alkaline, sometimes too acid, the antithesis of acid and alkali became the badge or catch word" of their system. Friedrich Hoffman (1660-1742) constructed another system which "supposed life to be a universally diffused ether, which entering the animal body, became transformed in the brain into Pneuma or nervous fluid. "George Ernest Stahl (1660-1734) believed in the hypothesis of Animism, and "the symptoms of disease were regarded as the conscious efforts of the soul to overcome the morbid influences". William Cullen (1712-90) "propounded a new system of medicine, intended to reconcile the opposing views of his predecessors. Its main feature was the importance attached to the nervous system in the causation of disease." Lastly the "Brunonian" system of John Brown, based on

¹ Adam's Commentary on Paul.

the doctrine of stimulus, and Hahneman's theory of homœopathy need be mentioned here to complete the list.¹ Thus we see that even some of the eminent men of science indulged in fanciful theories in quite modern times.

The study of ancient Hindu medicine has an antiquarian value. It is perhaps the oldest system of medical science still extant. Fragments of Egyptian and Assyrian medicine have no doubt been unearthed. But these cannot be compared with the complete system of the medical science as preserved in the early Sanskrit works on the subject. The Hindus believe their science of medicine to be of divine origin and this belief is founded upon the fact that the existence of the medical profession can be traced back to prehistoric times. The humoural theory is mentioned in the *R̥gveda*² which according to the consensus of opinions amongst the European savants can not be later than 2000 B.C., and possibly earlier. The Buddhists relate a story, how, in one of his former births, Buddha was born as a medicine-man. "In the Mahosadha birth the archangel Sakka came to him as he was being born, and placing some fine sandal-wood in his hand, went away. He came out from the womb holding this in his fist. His mother asked him "What is it you hold, dear, as you come?" He answered "Medicine, mother!" So because he came holding medicine, they gave him the name of medicine-child (oṣadhadhāraka). Taking the medicine they kept it in a chatty (an earthenware water-pot) and it became

¹ Medicine in modern Europe. Payne in Albutt's *System of Medicine* vol. I, p. 26, 29, 34.

² श्रीमान् शंवीरसकाय सुनने विधातुं शर्म वदतं शुभस्यती ॥

R̥gveda, i. 34, 6.

a drug by which all the sickness of the blind and deaf and others as many as came, was healed—so the saying sprang up, “This is a powerful drug”; and hence he was called Mahosadha (The great medicine-man).¹ This early date of the science amongst the Hindus is not exceptional. It is now well-known that so severe an operation as trephining the skull was often performed in the early stone age. “Trephined skulls from neolithic period have been found in most European countries, in Algiers, the Canaries, North America, Mexico, Peru and the Argentine”². In the Code of Hammurabi, king of Babylon (2285-2242 B. C.), there are thirteen articles regulating medical practice. One deals with the responsibilities of a surgeon performing operations on the eye. The laws Hammurabi lay down that:—

“If a Physician cause a severe operation wound with a bronze operating knife and cure the patient, or if he open a tumour (cavity) with a bronze operating knife and save his eye, he shall have ten shekels of silver.

“If it be a freedman, he shall have five shekels.

“If it be any one’s slave, his owner shall give the physician two shekels of silver.

“If the physician make a severe wound with a bronze operating knife and the patient die, or if he open a growth with a bronze operating knife and the patient lose his eye, he shall have his hands cut off.

“If a physician make a severe wound on the person of

¹ Rhys David’s *Buddhist Birth Stories*, vol. I, p. 67-68.

² Neuberger’s *History of Medicine*, P. 3.

a slave belonging to a freed man with the bronze operating knife and kill him, he shall replace the slave by another slave.

“If a physician heal a broken bone or cure diseased bowels, the patient shall pay the physician five shekels of silver.”¹

Homer pays tribute to Egypt for her

“Patron-god imparts

To all the Pharian race his healing arts.”

Herodotus says that the Egyptian physicians were specialists of particular diseases, and Clement of Alexandria mentions forty-two Hermetic books on medicine by the god Thot.

“According to Manetho, he (Teta) constructed the Royal castle of Memphis and wrote a work on anatomy² being particularly occupied with medicine. The latter supposition is rendered more complete to a certain extent by the account, due to Ebers Papyrus³, that the method of making the hair grow, described accurately therein, was supposed to have been discovered by our king’s mother, Shesh.”⁴ Teta was the second king of the first dynasty of the old Memphis kingdom and flourished in 4366 B. C. King Senta of the second dynasty owned a medical work which belonged to Senti or Hesepti (4266 B. C.), the 5th king of the first dynasty.⁵ “Tosorthros of the third dynasty, was said to have composed a treatise on medicine,⁶ a fact which

¹ Nouberger. *History of Medicine*, P. 18.

² Manetho, in Müller-Didot, *Fragmenta Historicum Græc*, vol. II, pp. 539, 540.

³ Ebers Papyrus, Pl. lxvi, 1, 5.

⁴ *Historian's History of the World*, vol. I, *Egypt and Mesopotamia*, p. 91.

⁵ *Ibid*, p. 68.

⁶ Manetho, etc., vol. II, p. 544.

caused him to be identified with the healing god Imhotpû."¹ These facts suggest a great age for Egyptian medicine, Medicine flourished among the Assyrians: "Fragments of an old work on medicine have been found, which show that all known diseases have been classified and their symptoms described; and the medical mixtures considered appropriate to each being compounded and prescribed quite in modern fashion."²

The oldest medical treatise extant amongst the Chinese is the Neiching, the authorship being attributed to Hwang-ti; it dates back to B. C. 2597. Mr. Gatzlaff,³ missionary in China, has given us a short view of a celebrated work, in 40 volumes, on Chinese medicines, which is called Ching che chun ching *i. e.*, "Approved marking line of medical practice"⁴ So the Hippocratic treatises (460 B. C.) are rather modern compilations compared to these ancient books; and as told by Plato, the priest of Sais was fully justified when he addressed to Solon: "You Greeks, you are but children."⁵

It will be seen again that a comparative study of the science discloses remarkable affinity to the systems of the other contemporary nations. The fabulous origin of medicine in India and Greece can not fail to attract the notice of even a casual observer. The resemblance of Dakṣa, the preceptor of the two Aśvins, the offspring of Sun, who after learning the

¹ Ibid, p. 544 and 545.

Quoted in Maspero's "The Dawn of Civilization." Edited by Prof. Sayce, 5th ed. p. 238.

² Assyria; its Princes, Priests and Peoples, Sayce, p. 119.

³ Proceedings of the Asiatic Society, Part VII, p. 154.

⁴ Royle, Antiquity of Hindu Medicine, p. 67.

⁵ Timæus, p. 22.

Āyurveda from their father became the medical attendants of the gods, to Æsculapius—the reputed son of Apollo, and his two sons Machaon and Podalarius, celebrated in the Homeric poems, is indeed remarkable. More remarkable is the belief in humoral pathology shared by the two nations, separated from each other by continents and seas, and alienated from each other by the differences in customs, manners and religion. The theory of independent origin and developement falls to the ground, especially when we consider the strange coincidence in the surgical instruments used by the two nations in performing surgical operations. Some of the instruments used by the Hindus were not only identical in structure and shape to the instruments of the Greeks, but they had even the same name. Thus for instance, the *alābu yantra* of the Hindus corresponds to the description of the *cueurbitula* of the Greeks, and both the terms mean a gourd. A *śṛṅga* is the horn; *aṅguli yantra* or *mudrikā* is the finger or ring-knife; *yoni-vraṇekṣaṇa* is the diopter or vaginal speculum; *aṅkuṣa* is the hook; &c. Some instruments though they have different names are identical in structure and uses. Thus, the *Scammum Hippocraticum* or the *Plinthium Nelei* is the Greek counterpart of the Hindu *kapātaśayana*; the lithotomy binding of the *yantraśatakam*; the clyster of the *vastiyantara*; the saw of the *karapatra*; the needle of the *sūcī*; &c. Again many surgical operations are similarly described in both the systems, as for examples, the operations for stone and cataract may be cited. In the description of diseases, passages occur in books which seem to be a literal translation of one from the other. Thus in describing the symptoms of hydrophobia, Paulus quotes Rufus who pronounces it to be a

species of melancholy and then observes "Which reason accords also with those who say that they think they saw the image of the dog that bit them in water". The word "those" in the above sentence becomes clear to us when we read a similar passage in the kalpasthāna of the Suśruta Sāṁhitā, and it may be thus translated :¹ "If the patient sees the image of the animal that bit him in the water or mirror, he is sure to die." Other passages might be multiplied but our limited space forbids any further quotations. All these coincidences can scarcely be accidental; and though we may not be able to trace the actual progress of medicine from India to Greece, yet the evidence in favour of its transmission is too strong to be held in doubt.

Thus the question of the relation of the medical science of the Hindus to that of the Greeks naturally suggests itself for solution. The possibility of a dependence of the either on the other can not be dismissed offhand for we have historical evidence of communication between the two nations at a very early age. We need not dwell at length upon those shoals and quagmires of historical controversies, the alleged conquest of India by Egyptian Scostis as recorded by Diodorus Seculus² in prehistoric times; the connection of the Phœnician traders as proved by the articles of merchandise,—cinnamon, aloes, onyx, agate, ebony, tin and ivory³ diamond, gold and

¹ अप्सुवा यदिवादर्शे रिष्टं तस्य विनिर्द्दिशेत् ॥

• , वसत्यकस्माद् योऽभीच्छन् शलाहट्टापि वा जलं ।

जलवाससुविद्यात् रिष्टं तमापिकीर्तितं ॥

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Suśrutā Sāṁhitā, V. vi.

² I. ib. I. ch. 43. Nolan.

³ Strabo. xv 37. Quotes Megasthenes; Theophrastus quoted by MacCrindle in Ancient India as described by classical authors, p. 46; Virgil. Georg. 11. 116-17 ("India alone produces black ebony"), Georg. 1. 57. ("India sends Ivory"), Lonsdale and Lee's trans.; Horace, odes 1. 31.

embroidered work¹ the commercial enterprises of the ships of Solomon (992 B. C.) from Ezion-Gaber² under the guidance of the mariners of Hiram (B.C. 980-917) which brought back the gold of "ophir," its almug trees and ivory, apes and peacocks; the possibility of an Indo-Hellenic intercourse to explain the remarkable coincidences between the systems of philosophy current amongst the two nations, and which culminated in the bold theory of Pococke³ that Pythagoras, who is generally considered to be the founder of the healing art amongst the Greeks⁴ was an adaptation of the Buddhugurus, and the assertion that Greece must have been an Indian colony before. Let us rather tread on firmer grounds and we know that two Greek physicians, Ktesias (about 400 B.C.) and Megasthenes (300 B. C.) visited Northern India. Ktesias in his *Indica* mentions the cochineal plant, its worm and dyes, monkeys, elephant and parrot. He says that the Indians were free from headache, toothache or ophthalmia and from mouth sores or ulcers. Alexander the Great (B.C.327), so says Nearchus, employed some Hindu vairs in his camp in India to consult them in cases of snake-bites and other dangerous ailments. Megasthenes mentions ebony as growing in Bengal, and tiger, monkey and elephants are also alluded to. Strabbo mentions that Daimacus was sent to the court of Candragupta's son, but unfortunately the book he wrote about India is lost to us. Mention also should be made of the intercourse of Egypt with India under the Ptolemies and we know, that Ptolemy

¹ Birdwood's *Industrial Arts of India*, pp. 263-4.

² *J. King*. ix. 27 ; xii, p. 22.

³ *India in Greece*.

⁴ See the *Origin and Growth of the Healing Art*—Beddoe, 162.

Philadelphous sent an embassy headed by one Dionysos to the court of Pātaliputra. Another source of dissemination of Hindu learning over the Western world is the emigration of the Buddhist missionaries to the kingdoms of Ptolemies and Greek kings as proved by the edicts of Aśoka. "And the Greek Simnoi (venerable) were no other than the Buddhist sramanas (these simnoi whom Clement of Alexandria has narrated to have rendered worship to a pyramid originally dedicated to the relics of a god, were the Buddhist Arhats (venerable) sramanas).¹ The intercourse of the East and West after the Christian era is well known and will not supply us with any proof as to the indebtedness of the Greeks and Hindus to each other; though "Dietz proves that the late Greek physicians were acquainted with the medical works of the Hindus, and availed themselves of their medicaments"; but he more particularly shows that the Arabians were familiar with them, and extolled the healing art as practised by the Indians, quite as much as that in use among the Greeks.²

But what is more important to us as a proof of the influence of the Indian medical science upon the Grecian system is the identification of drugs of Indian origin in the *meteria medica* of the Greeks. For instance the Sacred Bean of Pythagoras has been identified with Utpalam or Indian Nolumbium.³ Hippocrates the Great, who was contemporary and kinsman of Ktesias⁴ the court physician to the king of Persia, mentions :—*Sesamum Indicum* (Tila); *Nardostachys Jatamansi*

¹ Lalitvistarum. Mitter's ed. ch. I.

² Journal of Education, Vol. viii, p. 176.

³ Pratt's Flowering Plants, Vol. I, p. 67.

⁴ Galen; Comment, in libr. de artic. iii.

(*Jaṭāmāṁsī*); *Beswillia Thurifera* (*Kunduru*); *Zinziber Officinale* (*Śṛṅgavera*); and *Piper Nigrum* (*Marīci*). Dioscorides (1st century A.D.) in his *Materia Medica* describes:—*Agallochum*, *Bdellium*, *Ebony* (*Diosphynos Ebenaster*), *Ammomum zinziberis* (*Ginger*), *Calamus aromaticus* (sweet cane of Scripture), *Eletteria Cardamomum* (*Elaci*), *Lycium Indicum* or *Russot*, the product of *Berbera lycium*, *Atramentum* (*Indigo*), *Onyx* or the operculum of an Indian shell-fish, etc. In later times, we find *Aetius*, an Alexandrian writer of the 5th century describing Indian nuts, sandal wood, cocoanuts, etc. Symon Set mentions camphor; and *Paulus Aegineta* (7th century A.D.), a writer well known for his judicious condensation of the Greek medical literature, mentions *Aloes*, *Cantharides* (*Mylabris Cichory*), *Cloves* (*Caryophyllum Aromaticus*), *Millet* (*Panicum Halicum*), *Costos* (root of *Auklandia Costos*), *Cassia* (*Cinnamomum Cassia*), Indian stones as amulets, *Malabathri* or *tejpāt* (*Laurus Cassia*), *Ambar*, etc.

Now let us reproduce some of the conclusions arrived at by Western scholars as the result of the controversy. As regards philosophy, Colebrooke¹ asserts that “the Hindus were teachers and not learners”. Cunningham² says: “Indians have the advantage in point of time; and I feel satisfied that the Greeks borrowed much of their philosophy from the East” Weber³ remarks that “there is no ground whatever to suppose that *Saṁhita* borrowed his system of medicine from the Greeks, on the contrary there is much to tell against such an idea”.

¹ Transactions of the Royal Asiatic Society, vol. I.

² *Bhīṣa Topes*, pp. 32-33.

³ *History of Indian Literature*.

Prof. Diaz of the Konnigsberg University, detects the principles of Indian medicine in the medical literature of the Greeks". "It is to the Hindus" says Wise, "we owe the first system of medicine." Royle has proved beyond doubt the indebtedness of the Greeks and Arabs to the Hindus. Haas's theory that *Suśruta* is the Indian adaptation of the Arabic name of *Suqrat* or *Buqrat*, the Arabic corruption of the Greek *Hippocrates*, and that *Kāsi* is an adaptation of the Island of *Cos* has been deservedly condemned as "an elaborate joke". Neuberger says:¹— "The similarity between Indian and Greek medicine of the period is in its outline and in certain details so striking that it is hardly surprising that the originality of the former has frequently been questioned or even denied. The more so is this true since the dates of the more important Indian works are fixed with the greatest difficulty, and before the discovery of the most recent manuscripts they were quite indefinite.

In consideration of the outstanding independent achievements of the Indians in most branches of science and art, and of their aversion from foreign influences, the trend of opinion to-day, informed by recent discoveries is in favour of the originality of Indian medicine in its most salient features."

Another fact must here be pointed out that the Hindus always acknowledged any help they might have received from other nations for the development of their science. The striking proof of this is found with reference to the science of astronomy—the only branch of learning which seems to have been influenced by the Greeks. *Varāhamihira* compiled his famous *Pañca-sidhāntica* or the collection of the five old treatises on astronomy,

¹ Neuberger. History of medicine, Vol. I, p. 45.

viz., Paulisa, Romaka, Vaśiṣṭha, Saura, and Paitamoha. Both Weber and Kern have no doubt that Paulisa was a Greek and the name Romaka speaks for itself. But in the Hindu medical literature there is no mention of any foreign help, and the Indian medical treatises do not contain a single technical term which points to a foreign origin. It is interesting to quote the well known passage of Garga: "The Yavanas (Greeks) are Mlecchas, but amongst them the science (astrology) is well established. Therefore they are honoured as R̥sis—how much more than an astrologer who is a Brāhman". It is a standing monument of the catholic spirit of the Hindus, and they know no better way to show their respect for the learned men of the world. To this may well be contrasted the behaviour of the Greeks towards the other nations. The doctrines of Pythagoras are pre-eminently Indian¹, but that philosopher has not a word to speak of the Hindus. In astronomy the Greeks are indebted to Babylon: Ptolemy mentions that Hipparchus worked out and improved upon the astronomical computations of the Babylonians with reference to the moon; but recent discoveries from the clay tablets have shown that the figures ascribed to Hipparchus are merely copied from the numerical values worked out in Babylon. "The discovery of the precession of the equinoxes is generally ascribed to Hipparchus. It was he indeed, who brought this fact to the Greeks, and he estimated its yearly amount as from 36 to 39 seconds but it is certain that he learned about it in Chaldea, and that he obtained the elements of his calculations from the astronomical observations made on the lower Euphrates".² Paulus Aegineta

¹ See Enfield's History of Philosophy.

² Historian's History of the World. Vol. I, p. 596.

gives us a complete system of operative surgery of the ancients. Celsus, in the last two books of his work, has treated of the surgical operations with considerable accuracy; and though the former availed himself of the labours of the latter, Celsus is never mentioned as one of the sources of informations used by Paulus who appears to have been wholly unacquainted with his works; and Adams remarks "but when did a Greek writer ever acknowledge himself under obligation to a Roman"?

But are we to suppose that the Greeks wilfully concealed the names of the Indian physicians in their books? Surely not. The Greeks might not have known the real source of the informations which they probably received second-hand. There is historical evidence of an intercommunication between Greece and Persia from the time of Ktesias or the 4th century B. C. to the 6th century A. D. We also know of a tradition that the services of the Great Hippocrates—a kinsman of Ktesias, were required in the Persian court, but he declined the invitation. Again we know that books on ancient sciences of India were possibly made use of by the Persians in early times, and to this intercommunication may be due "the coincidences which have been observed between the science of the Greeks and that of the Hindus" (Royle).

As regards the indebtedness of the Persians to Sanskrit literature, "we have positive testimony on the subject, as the Baron de Sacy, in his account of the well-known Sanskrit origin of the Fables of Pîlpay, states that these were first translated in Pehlevi during the reign of the Persian king Nooshirwan, who ascended the throne in 531, and died in 579 and who is reported by historians to have encouraged learning, and to have induced Greecian philosophy at his court. The translation

were made by the physician Barzouyeh who had brought the original from India with other books, and who by more than one previous journey to that country, had acquired a knowledge of Sanskrit. He is stated particularly, to have made two journeys, one for the purpose of procuring medicaments and herbs, and the other for obtaining specimens of literature of the Hindus”¹. “Previous even to this (A. D. 330), we hear of the Persian king Bahram visiting, in disguise, the court of Basdeo, sovereign of Canouge, to study the laws, religion and manners of the Hindus.”²

But whatever differences of opinion there may be as regards the relation of the Greeks to the Hindoos, there is no doubt that the medical science of the Arabs was materially influenced by Hindu medicine. For we know that the medical treatises of Caraka, Suśruta and Mādhava were translated into Arabic in the beginning of the 8th century A. D., and the names of *Scarac*, *Scirac* or *Xarac* and *Sarac* occur in the Latin translations of Avicenna, Rhases, and Serapion.³ Rāy dwells at length on the similarity of description of leeches as written by Suśruta and Rhazes. The modern medical science of the West is principally based on the Grecian system as preserved in the books of the Arabian authors and so indirectly depends for some particulars at least upon the Indian system.

Sachau in his preface to Alberuni’s *India*⁴ remarks as

¹ *Antiquity of Hindu Medicine*, p. 168-69.

² *Ibid*, p. 73.

³ Rhazes: ‘*De Emblico*,’ (*Scarac Indanus*), ‘*De Zinzibere*,’ (*Sarac*)
Serapion: ‘*De Myrobalanis*’ (*Xarch Indus*), ‘*De Emblicis et*
bellericis’ (*Xarcha Indus*); Avicenna: ‘*Sub Emblico*’ (*Scirac Indum*).

⁴ *Alberuni’s India*, Preface, p. xxv-xxxi.

follows:—"What India has contributed reached Bagdad by two different roads. Part has come directly in translations from the Sanskrit, part has travelled through Iran, having originally been translated from Sanskrit (Pali ? Prakrit ?) into Persian, and further from Persian into Arabic. In this way, *e.g.* the fables of Kalila and Dimna have been communicated to the Arabs, and a book on medicine probably the famous Caraka. *cf.* Fihrist p. 303". The Arabs also translated "Indian works on snakes (*sarpavidyā*), on poison (*vi-savidyā*).....on the veterinary art¹.....But not only were the medical books translated into Arabic we have evidence that Indian doctors practised in foreign courts. Sachau continues :² "Another influx of Hindu learning took place under Harun (A. D. 786-808). The ministereal family Barmak, then at the zenith of their power, had come with the ruling dynasty from Balkh, where an ancestor of theirs had been an official in the Buddhistic temple Naubehar, *i. e.*, nava vihāra—the new temple (or monastery). The name Barmak is said to be of Indian descent, meaning paramaka, *i. e.*, the superior (abbot of the vihāra ?) *cf.* Kern, Geschichte des Buddhismus in Indien, ii. 445, 513. Of course, the Barmak family had been converted, but their contemporaries never thought much of their profession of Islam, nor regarded it as genuine. Induced probably by family traditions, they sent scholars to India, there to study medicine and pharmacology. Besides, they engaged Hindu scholars to come to Bagdad, made them the chief physicians of their hospitals, and ordered them to translate from Sanskrit

¹ Alberuni's India, Preface, p. xxxiv.

² Ibid p. xxxii.

into Arabic, books on medicine, pharmacology, toxicology, philosophy, astrology, and other subjects. Still in later centuries, muslim scholars travelled for the same purpose as the emissaries of the Barmak, *e. g.*, Almuwaffak, not long before Alberuni's time (Codex Vindobonensis, sive medici Abu Mansur liber, fundamentorum pharmacologiæ, Ed. Selignann, Vienna, 1859, pp. 6, 10, and 15, 9)."

"Harun-al-Rashid (786-809) had two Indians Manka and Saleh, as physicians at his court"¹ Manka translated the classical work on medicine, Suśruta (*cf.* Steinschneider, Wissenschaftliche Blätter, Vol. I, p. 79) and a treatise on poison, ascribed to Kānakya, from Sanskrit into Persian (see Prof. Flügel, in Zeitschrift der D. M. G. xi. 118 and s. 325). A Hebrew treatise on poison, ascribed to the Indian Zanik (Kanakya) is mentioned by Steinschneider Wissenschaftliche Blätter, Vol. I, p. 65). Alberuni mentions an Indian Kankab as astrologer of Harun-al-Rashid (Reinaud, memoire sur l'Inde, p. 315). He is likewise mentioned as a physician. Another Indian physician of Harun-al-Rashid is called Mankba (Reinaud). In the year 1381, a work on veterinary medicine ascribed to Salotar was translated from Sanskrit by the order of Firroz Shaha after the capture of Nagorecote. A copy of it was preserved in the Royal Library of Lucknow². Among the Hindu physicians of the time one ابن دهن is mentioned *i.e.*, the son of DHIN, director of the hospital of the Barmaks in Bagdad. This may be Dhanya, or Dhanian chosen probably on account of its etymological relationship with the name Dhanvantarī the name

¹ Prof. Dietz, quoted by Royle, p. 64.

² Maxmüller's Science of Language, Vol. I, p. 166.

of the mythical physician of the gods in Mann's law book and the epics (*cf.* A Weber, *Indische Lithuraturgeschichte*, pp. 284, 287). A similar relation seems to exist between the names Kanka, that of a physician of the same period, and Kankayana, an authority on Indian medicine (Weber *l. c.*, pp. 287, note, and 284 note, 302). The name *اطر*, that of an author of a book on drinkables, may be identified with Atri, mentioned as a medical author by Weber, *l. c.* p. 288."¹

For informations on the Arabic translations of Sanskrit works, see *Analecta Medica* by Dietz; Wustendeld's *Geschichte der Arab Aerzte*; Cureton, "A collection of such passages relative to India as may occur in Arabic writers"; Wilson's note to the above in *J. R. A. S.* old series, vi, pp. 105-115. Puschmann, p. 162; and Bedræ, book iv. ch. 11. pp 286-299.

The Arabians added many drugs to the *meteria medica* of the Greeks and amongst them we find the following Indian drugs described :—

Diudar or Pinus Deodara.....	Devadāru ²
Artemesia Indica.....	Nāgdamani.
Piper cubeba.....	Sugandha marica.
Cassia fistula.....	Suvarnakha.
Senna or Cassia obvata... ..	Sonāmukhī.
Galangal or Alpina galangal, Roxb.....	Kulin-jana.
Ammomum grana paradisi.	
Macis.....	Mace.
Nux moschata.....	Nutmeg.

¹ Sachau. *Ibid* p. xxxii.

² It is described by Avicenna under its Sanskrit name, where he says that diudar, "est ex genera abhel juniperus, que dicitur pinus Inda; et syr diudar est ejus lac" (Quoted by Royle).

Bdellium.....	Guggula.
Tamarindus Indica.....	Tintiḍī.
Trifolia.....	Triphala. ¹
Myrobalani.....	Haritaki.
Turpeth or Convolvulus Turpethum.....	Trivit.
Scl or Aegle marmelos.....	Vilva.
Santalum rubrum.....	Candana.
Melia azadirachta.....	Nimba.
Tembul (Piper betel).....	Tāmbūl.
Faufil (Arecha catechu).....	Khadira.
Nux vomica	Viṣamuṣṭi.
Musa paradisiaca or plantain.....	Kadalī.
Mosechos moschifera (from Thibet & India)	Mrganābhi.
Dolichos lebleb.	
Orange or Citrus aurantium.....	Nāgaratiga.
Limon or citrus medica.....	Mātuluṅga.
Pearls and other precious stones such as lapis lazuli. Borax, &c.	
Rhabarburnum or Indian Rhubarb, etc.	

We can trace the Arabic and Greek names of some of the medicaments to a Sanskrit source. Royle has discussed them at length, so we need give here only a synopsis of it:—

Triphalā (S)—Tryphalla (A)—Tryphalla (G)—Tryphala parva (modern).

Devā¹śru (S)—Deiudar(Avicenna)—Deedara (G)—Pīṇus deodaru.

Tvaka-kshira (S)—Tabosheer (A).

Tamālpatra (S)—Malatroon or Malabathrum (G).

Tejapatra(s), or tuj—Sadej (A).

¹ Actuarius copies from Serapion and Mesue, the use of this medicine. The very name is Sanskrit, meaning the 3 myrobalans. Serapion refers to Xarch indus or Charak, in his De Myrobalani (Royle, p. 37).

Tāmbula (S)—Tumbol (P)—Tunbol (A).

Pippalī (S)—Pippul (H)—pilpil (P)—filfil (A)—(G)—
piper (E).

Śrīṅgavera (S)—Shingveez (P)—Zinzabil (A)—Zingiber (E).

Aguru (S)—aggur (H)—Agila (M)—Pao-d'aglia (aquilia)
(po)—Aod Hindē Agallochum (G).

Candana (S)—chundan (H)—Shandana (T)—Sundul (P)—
Santal (E).

Kolinjana (S)—Galanga (G).

Vaca (S)—Wuz (A).

Dāvrusita (S)—Darcheeni (H)—Darshceeni (A).

Cacyn-nama (C)—Akimona (P)—Kaimanis (M)—Cinnamon.

Kuṣṭha (S)—Kooth (H)—Kust (A)—Koosrus (G)—
Koṣṭha (Sy).

Abnus—Ebony (E).

Kubara (S)—pupal (P)—fufal (A).

Sajikā (S)—Sajimattee, sajiloon, sajii (H)—Sajimen vitri
(Geber)—Soza or soda (E).

Khar, khari (S)—Kali. (A).

Kussas, missy (India)—misy (A)—misy (G).

Tincana (borax)—Tinkar (P)—tincal (E).

Ambara (S)—Kharoba (A)—Amber, Ambegrise (E).

Kassis (tin)—Kassiteros (G).

Tuttha (S)—tootum or tutia (H)—tutia (P)—tatanagum
• (T)—tutenagum and tutty.

Manaśilā (S)—Mansil (G).

Haritāl (S)—hartal.

Sarkarā (S)—sakkara (T)—sukkur (A)—Sugar (E).

Sandaracha (S) or sulphuret of arsenic—Zarnach (P & G).

Sphotaka (S)—phoska (B)—pocca (A. S.)—pocke (Ger).

Tintiḍi (S)—Tamar Hind (A)—Tamuarin (Fr)—Tamarinds
(Italy & Sp.)—Tamarind (B)—Tamarindus India (L).

Masurikā (S)—Masern (Ger)—Measles (E).

Vraṇa (S)—verole (Fr)—variola (L).

Danga (Hindus)—Dandy—Dengue (Sp).

S—Sanskrit. A—Arabic. G—Greek. T—Tamil. P—
Persian. M—Malayan. Po—Portuguese. Sy—Syriac. Ger
—German. A. S.—Anglo-Saxon. H—Hindi. E—English.
B—Bengali. Fr—French. L—Latin. It—Italy. Sp—Spanish.

Not only is the influence of the Sanskrit medical works detected in the Persian, Hebrew, Arabic, Greek and Roman works on medicine, there is evidence that the Hindu system of medicine was also adopted by the Tibetans and the Chinese. In the January No. 37 of the J.A.S.B. 1835 Vol. IV, an analysis of a Thibetan work is given by Alexander Csoma de Koros. It is called "rgyud bzhi" (the tract in 4 parts). It is attributed to Sakhya. "In the time of Khrisrong Dehutsan (*i.e.* 8th or 9th century of the Christian era) a Tibetan interpreter Bairotsana (or Vairochana) having translated in Cashmere, with the assistance of physician-pandit (Davam Non-gah) presented it to the above mentioned Thibetan king." In a Note on Thibetan surgical instruments, Walsh says:¹ "The present practice of surgery in Tibet is very simple, and, as already noted, consists chiefly of cupping, cauterizing, and bleeding. The Am-chhi informed me that the only instruments used are the cupping-bow (མེལུང me-puṅ, or མེལུང me-bum, both meaning 'fire vessel'), in which

¹ The Thibetan Anatomical System by E. H. C. Walsh in J. R. A. S. 1910, pp. 1244-45.

paper is lit and the bowl is placed while hot over the part to be blistered; the sucking-horn (འཇིབ་རུ་ /jib-ru), by which cupping by vacuum is done; the cautery (ཉུགས་མེ་ /chags-me), the lancet (རྩ་ཕྱ་ /tsa-u), for bleeding, and a golden lancet (གསེར་ཀྲི་རྩ་ཕྱ་ /gser kyi rtsa-u) for operating on the eye.

In the journal of the Buddhist Text Society of Calcutta for 1894 three Tibetan block prints are illustrated, which contain representations of a large number of surgical instruments, some of them of an elaborate nature, including specula, saws, catheters, exploring needles, instruments for tapping hydrocele, and midwifery and other forceps. The block-prints were brought by Rai Sarachandra Das, Bahadur, from Lhasa,¹ and a description of the figures was given by the late Lama Śes-rab MGya Mtsho, the Abbot of Ghoom Monastery, near Darjeeling, who was formerly physician to the late Tashi Lama, which were explained in a paper read by Dr. Saradaprasad Banerjee.²

If the elaborate and various instruments shown in the block-print were ever in general use they appear to have now ceased to be used."

In the J.R.A.S. April 1907, is mentioned "a Chinese text corresponding to a part of the Bower manuscript" by Watanbe. The identified portion of the MSS. consists of the six leaves which appear in plates XLIX-LIV (Hoernle's ed). The corresponding Chinese text is contained in six translations of which the following three, correspond completely to the MSS.

¹ Journal of the Buddhist Text Society, Vol. II, Pt. III, Calcutta 1894.

² Ibid, pp. IX. X.

1. Mohamayuri vidya-rajui—translated by I'tsing 705 A.D.
2. " " " Amoghavajra 746
to 771 A.D.
3. " " " Sanghapala 516
A.D.

Again many articles are common to the Hindus and Chinese *materia medica*; as many aromatics (nutmeg, cloves, cinnamon and pepper), musk, rhubarb etc. And this is not at all surprising for we have evidence "that there was constant intercourse¹ between these countries even before the Christian era, by means of travellers and ambassadors; and that Buddhist priests in visiting China, took with them as presents classical Indian books. It is also worthy of note, in connexion with the chapter on this subject in *Suśruta*, that in A.D. 648, the Emperor of China having sent an ambassador to India, this officer met with a doctor, who told him that he was 200 years old, and that he possessed the recipe of immortality, upon hearing which, a second embassy was despatched in search of the philosophical stone" (Royle).

Even the modern medical science of Europe has been directly influenced by the Hindu system of medicine. In the *materia medica* used by the doctors in Europe now, we find the following curative agents—the produce of India. I quote here the list as prepared by Thakore Shaheb² :—

" <i>Aconitum heterophyllum</i>	...	Ativisha.
<i>Allium cepa</i>	...	Polandu.
<i>Acacia catechu</i>	...	Khadira.

¹ See Asiatic Journal, July 1836.

² History of Aryan Medical Science, P. 128.

<i>Alhagi maurorum</i>	...	Yavasa.
<i>Alstonia scholaris</i>...	...	Saptaparna.
<i>Ammomum elettarum</i>	...	Ela.
<i>Andropogon nardus</i>	...	Ushira.
<i>Andropogon schænanthus</i>	...	Katurina.
<i>Artemisia sternutatoria</i>	...	Agnidamani.
<i>Berberis lycium</i> ...	...	Daruharidra.
<i>Butea frondosa</i> ...	...	Palasha.
<i>Cassia lanceolata</i> ...	...	Sonamukhi.
<i>Cucumis colocynthis</i>	...	Indravaruni.
<i>Datura alba, niger &c.</i>	...	Dhattura.
<i>Justicia adhatoda</i>...	...	Atarusha.
<i>Luffa amara</i> ...	...	Katukoshtaki.
<i>Linum usitatissimum</i>	...	Atasi.
<i>Mallotus Philippiensis</i>	...	Kapillaka.
<i>Myrica sapida</i> ...	...	Katfala.
<i>Ophelia chiretta</i> and <i>Ophelia</i> <i>augustifolia</i> ...	...	Kirata.
<i>Pimpinella Anisum</i>	...	Shatapushpa.
<i>Pongamia glabra</i>...	...	Karanja.
<i>Ptychotis ajowan</i> ...	...	Ajamoda.
<i>Ricinus communis</i>	...	Eranda.
<i>Salvinia cucullata</i>	...	Undurkarnika.
<i>Santalum album</i> & <i>Santalum</i> <i>flavum</i> ...	...	Chandana.
<i>Shorea Robusta</i> ...	...	Ajakarna.
<i>Strychnos potatorum</i> , <i>Strychnos</i> <i>nux vomica</i> ...	...	Katakafala.
<i>Tinospora Cordifolia</i>	...	Guçuci.

Valeriana Hardwicki	...	Tagara.
Wrightia Antidysenterica	...	Indrayava."

To this list may be added the following drugs from the Indian and Colonial Addendum to the British Pharmacopœa, 1898:—

Acacia Arabica	...	Vāvvula.
Acalypha Indica	...	Muktabarṣi.
Andrographis Paniculata	...	Kirāta.
Aristolochia Indica	...	Arkamula.
Arachia Hypogaea	...	Bucanaka.
Citrus Aurantium	...	Nāgarāṅga.
Azadirachta Indica	...	Nimba.
Aegle Marmelos	...	Vilva.
Piperbetel	...	Tāmbula.
Butaea Gummi.		
Cesalpina Sappan...	...	Patanga or Bakam.
Calotropis Procera and		
C. Gigantie	...	Arka.
Gossypium Herbaceum	...	Kārpāsa.
Cambogia Indica.		
Cissampelos Pariera	...	Ambashthai.
Coccinum Fenestratum	...	Dāru-haridrā or darvi.
Gynocardia Odorata	...	Chālmugra.
Hygrophila Spinosa	...	Kokilākṣa.
Anogeissus Latifolia		
Embelia Ribes and E. Robusta...	...	Viḍaṅga.
Plantago Ovata	...	Ispaghula.
Ipomœa Hederacea	...	Kālālāna.
Ipomœa Turpethum	...	Trivit.

Mylabris Phalerta.

Terminalia Chebula ... *Haritakī.*

Sesamum Indicum ... *Tila.*

Picrorhiza Kurroa ... *Katuka.*

Urginea Indica ... *Vanapalāṇḍu.*

As regards the medicines used by the Hindus, Neuberger says¹ :

“The Pharmacopia, corresponding with the fruitful nature of the land was a rich one and stamps Indian medicine with a character entirely its own, whilst nothing speaks more eloquently for its originality than the fact that of all the many medicinal plants no single one was European.”

Elphinstone wonders at the knowledge of simples in which the Hindus early gave lessons to Europe and “more recently taught us the benefit of smoking *Datura* in asthma and the use of cowitch against worms,” and “the prescribing of *Nux Vomica* in paralysis and dyspepsia, and the revival of the use of *Croton Tiglium*” (Royle). In surgery, too, the modern surgeons of Europe have borrowed the Indian method of Rhinoplastic operation first made known to European surgeons by a letter which was printed in the Gentleman’s Magazine for October 1794, p. 891. In fact Dr. Hirschberg of Berlin says that “the whole plastic surgery in Europe had taken its new flight when these cunning devices of Indian workmen became known to us. The transplanting of sensible skin flaps is also an entirely Indian method.” The modern method of making pockets for the

¹ Neuberger, History of Medicine, vol. I. P. 54.

testicles under the Colles' fascia after the operation for scrotal tumour (elephantiasis) can be traced back to the age of Śuśruta¹.

Thus we see that it can safely be affirmed that the medical science of Europe has been, both directly and indirectly, influenced by the Hindu System of Medicine.

¹ पादौ निरक्तमुष्कस्य जलिनं प्रोत्थ्य चाबिष्यी ।

प्रवेष्ट्य तन्मसि वन्दा मुष्कौ मील्येत्ततः परं ॥

Suśruta Saṁhitā, IV. ii.

THE END.

APPENDIX.

I'Tsing¹ says :—

“The following are the eight sections of medical science. The first treats of all kinds of sores ; the second, of acupuncture for any disease above the neck ; the third, of the diseases of the body ; the fourth, of demoniac disease ; the fifth, of the Agada medicine (i.e. antidote) ; the sixth, of the diseases of children ; the seventh, of the means of lengthening one's life ; the eighth, of the methods of invigorating the legs and body. ‘Sores’ (1) are of two kinds, inward and outward. The disease above the neck (2) is all that is on the head *and face* ; any disease lower down from the throat is called a ‘bodily’ disease (3). The ‘Demoniac’ (4) is the attack of evil spirits, and the ‘Agada’ (5, but 6 of Âyur-veda) is the medicine for counteracting poisons. By ‘Children’ (6, but 5 of Âyur-veda) is meant from the embryo stage until after a boy's sixteenth year ; ‘lengthening life’ (7) is to maintain the body so as to live long, while ‘invigorating the legs *and body*’ (8) means to keep the body and limbs strong and healthy. These eight arts formerly existed in eight books, but lately a man epitomized them and made them into one bundle. All physicians in the five parts of India practise according to *this book*, and any physician who is well versed in it never fails to live by the official pay. Therefore Indians greatly honour physicians and much esteem merchants, orf^o they do not injure life, and they give relief to others as well as benefit themselves. I made a successful study in medical

¹ A Record of Buddhist Practices, Ch. XXVII, pp. 127-8.

science, but as it is not my proper vocation I have finally given it up."

Dr. Takakusu¹ comments on the passage as follows :—

"The eight sections of Medicine which I-tsing describes are no doubt the eight divisions of the Âyur-veda. He mentions an epitomiser of these divisions, who seems to have been a famous physician and contemporary of I-tsing (or just before I-tsing). This epitomiser may be Susruta, who calls himself a disciple of Dhanvantari, one of the Nine Gems in the Court of Vikramâditya.

Prof. Wilson says in his Works, vol. iii, p. 274 :—

"The Âyur-veda, which originally consisted of one hundred sections, of a thousand stanzas each, was adapted to the limited faculties and life of man, by its distribution into eight subdivisions, the enumeration of which conveys to us an accurate idea of the subject of the *Ars Medendi* amongst the Hindus.

The eight divisions are as follows :—

I. Sâlya (I-tsing's (1) cure of sores).

The art of extracting extraneous substances, grass, earth, bone, &c., accidentally introduced into the human body, and by analogy, the cure of all phlegmonoid tumours and abscesses. Sâlya means a dart or arrow.

II. Sâlākya (I-tsing's (2) art of acupuncture).

The treatment of external organic affections or diseases of the eyes, ears, nose, &c. It is derived from Sâlākā, "a thin and sharp instrument," and is borrowed from the generic name of the slender probes and needles used in operation on the parts affected.

¹ A Record of Buddhist Practices, Ch. XXVII, pp. 222-3.

The above two divisions constitute the surgery of modern schools.

III. Kâya-kikitsâ (I-tsing's (3) treatment of the diseases of the body).

The application of the *Ars Medendi* (Kikitsâ) to the body in General (Kâya). It forms what we mean by the science of medicine.

IV. Bhûta-vidyâ (I-tsing's (4) treatment of demoniac disease).

The restoration of the faculties from a disorganised state induced by demoniacal possession. The art vanished before the diffusion of knowledge, but it formed a very important branch of medical practice through all the schools, Greek, Arabic, or European.

V. Kaumâra-bhritya (I-tsing's (6) treatment of the diseases of children).

The care of infancy, comprehending not only the management of children from their birth, but the treatment of irregular lactic secretion, and puerperal disorders in mothers and nurses.

VI. Agada (I-tsing's (5) Agada medicine).

The administration of antidotes—a subject which, as far as it rests upon scientific principles, is blended with our medicine and surgery.

VII. Râsâyana (I-tsing's (7) application of the means of lengthening one's life).

Chemistry, or more correctly alchemy as the chief end of the chemical combinations it describes, and which are mostly

metallurgic, is the discovery of the universal medicine—the elixir that was to render health permanent, and life perpetual.

VIII. *Vāgīkaraṇa* (I-tsing's (8) methods of invigorating the legs and body).

Promotion of the increase of the human race—an illusory research, which, as well as the preceding, is not without its parallel in ancient and modern times.'

Prof. Wilson further remarks :—'We have, therefore, included in these branches all the real and fanciful pursuits of physicians of every time and place. Susruta, however, confines his own work to the classes *Sālya* and *Sâlākya* or surgery; although, by an arrangement not uncommon with our own writers, he introduces occasionally the treatment of general diseases and the management of women and children when discussing those topics to which they bear relation.' (See *Wilson's Works*, vol. iii, p. 276.)"

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